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PRODUCING REFINING MARKETING

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Mid-Continent Production on Up Grade

California Output Crowded the 600,000 Barrel Mark. Tonkawa, Oklahoma, Rivals Burbank. Wildcat Activity in Oklahoma.

By James McIntyre

Tonkawa, Okla., production averaging 69,616 barrels a day the past week, is rapidly approaching that of Burbank, which registered an average of 71,507 barrels, and next week Tonkawa is expected to pass Burbank in daily output. Eleven big wells which came in the previous week, were responsible for the increase in Tonkawa production. The Wetumka district in Hughes County once more came into prominence with two big wells, one of the Prairie Oil & Gas Co. and Wilhoit No. 3-C Martha Gregory, in Section 5-9-10, starting at 1,400 barrels and the other the Carter Oil Company's No. 1 Hully, also in Section 5, which started at 30 barrels an hour and was holding up around 600 barrels a day several days later. The Waite Phillips Company extended Burbank Field in Osage County almost a half mile westward with a 250 and a 400-barrel well, Nos. 5 and 6, in the northwest quarter of Section 35-27-5. In Tulsa County, Obins & Weber have a 400-barrel well in No. 1 Edwards in Section 1-18-12, but showing some sediment and water. In the Bristow Field, Creek County, the Phillips Petroleum Company's No. 5, southwest quarter of Section 4-15-9 made 800 barrels the first day. In the Schulter district, Okmulgee County, the Mitchell Oil Company finished a 175-barrel well in No. 7 Randall, Section 30-12-12. In northern Okfuskee County, Scott and others' No. 2 Daniels, Section 4-12-11, was good for 500 barrels the first day and settled to 150 barrels.

North Texas

The production of the North Central Texas fields showed an increase of 3,390 barrels per day in the past week, the newer pools being responsible for most of this. In the Hirschi Pool, Wichita County, the Texhoma Oil & Refining Company's No. 2 Hirschi is a 300-barrel well at 1,885 feet. Very promising wells of Bridwell & Heydrick on the Waggoner lease and the Associated Oil Company's No. 1 Grace Jennings, the latter about three miles south and east of Electra, are reported. Also east of Electra the Camp Oil & Gas Company finished a 150-barrel well in No. 4 Douglas. The Magnolia Petroleum Company has an oil and gas showing in a semi-wildcat, 3 miles northeast of Electra. Green and others' No. 1 Jennings, east of Electra, was flowing 400 barrels. In Archer County several wells were completed and many new locations made. The best of the new wells was a 200-barrel producer of the Texhoma Oil & Refining Company's No. 1 Cetti, a mile southeast of the Freeman-Hampton Pool, showing 150 barrels of oil, but 200 barrels of water, but an even better well is promised in the Comet Petroleum Company's unfinished No. 2 Ferguson, which has been showing 400 barrels. Knight & Hines' important wildcat, No. 1 Annia Jackson, 7 miles north of Archer City, has been abandoned at 1,810 feet. Stephens County is due for a lot of development this spring, because of the increased price of crude. The Gulf Production Company's No. 3 Kloh-Rumsey, 18 miles northwest of Breckenridge, is a 700-barrel well. In Eastland County the Panhandle Refining Company's No. 1 Fox, four and a half miles southeast of Eastland, is good for over 200 barrels and not yet finished. It is a semi-wildcat. The Root, Rhodes & Sykes' No. 2 Hill, in the lake district, is flowing 300 barrels a day. In northern Brown County, Crabb and others' No. 1 McDonough, 7 miles south of Cross Plains, is showing for more than 100 barrels. Three wells completed in that pool prove a territory about four miles wide from east to west.

MID-CONTINENT PRODUCTION

Estimated daily production of Mid-Continent oil fields at the close of the past week was as follows: North Louisiana, 67,585 barrels; El Dorado, 13,740 barrels; Smackover, 74,100 barrels; other Arkansas fields, 4,595 barrels; East Central Texas, (Mexia Currie and Corsicana), 61,000 barrels; North Central Texas, 117,900 barrels; Kansas, 84,000 barrels; Oklahoma—Cushing and Shamrock, 27,250 barrels; Healdton, 17,300 barrels; Hewitt, 25,800 barrels; Burbank, 71,507 barrels; Lyons-Quinn, 9,000 barrels; Tonkawa, 69,616 barrels; other Oklahoma fields, 216,250 barrels; total for all fields, 854,931 barrels.

The total represents a gain of 4,442 barrels as compared with the preceding week. The estimated daily production of heavy-gravity oil in the Gulf Coast Field was 106,195 barrels.

Gulf Coast

Development work in the Coastal pools is being delayed by weather conditions, with the result few completions were reported during the past week. Production continues to maintain its usual average, that for the past week being 106,195 barrels daily, decrease of 1,945 barrels from week before. In the Hull Pool, the Humble Oil & Refining Company has a wild gas well in its No. 17 Guedry on the south side of the dome. It is estimated to be making 25,000,000 cubic feet daily. On the west side of the dome, this company's No. 3 Abel made 400 barrels by heads the first 24 hours from a depth of 920 feet and then stopped flowing. At Barber Hill, the North Dayton Oil Company's No. 1 Richardson is flowing 150 barrels by heads at 2,230 feet. In the Vinton Pool, in southern Louisaina, the Gulf Refining Company got a 100-barrel well in No. 55 G. N. G. at 2,300 feet and The Texas Company's No. 19 Gray is good for 175 barrels at 2,475 feet. In the Laredo district, the Nuevo-Cin-Tex Oil Company's No. 1 is making 175 barrels at 1,610 feet. The Eubank-Kirkwood Oil Company's No. 3, Survey 2341, has increased it's output to 800 barrels at 1,580 feet. In Pecos County, Troy and others' No. 1 Johnson is shut down. Many old wells are being worked over in the Coastal pools and old leases are being overhauled, as operators expect another advance in the price of Coast crude and expect to revive old wells and put them on the jack or beam.

Arkansas-Louisiana

In the high grade portion of the Smackover Field, in Arkansas, the Boderick & Calvert big well and two of its offsets have stopped flowing. In the heavy oil district of the field the Imperial Oil & Gas Products Company's second big well in Section 6-15-15, is flowing between 10,000 and 15,000 barrels a day. The Woodley Petroleum Company's No. 1 Anderson, in Section 33-15-16, is a 4,000-barrel well, extending the light oil district half a mile northeasterly and within 2 miles of the heavy oil district. Eight wells were completed in the Union County area of the Smackover Field and 14 wells were completed in the Ouachita County side of the field, the Ouachita wells aggregating 16,615 barrels in initial production and 15,000,000 feet of gas. The Humble Oil & Refining Company's No. 4 Hildebrand in Section 28-15-15, is a 5,000-barrel well and the Pure Oil Company's No. 3 Bristler is a 4,000-barrel well, and the Sinclair Oil Company's No. 1 Berry, east of its No. 2, is flowing 4,000 barrels. In Louisiana little of interest was reported.

Eastern Fields

The new shallow sand pool in Columbiana County, Ohio, a 500-foot development, is the most interesting in the Eastern field. Thomas Hiland has a production of 125 barrels a day on the Butler farm, and a number of other operators have a good paying production on leases which do not cost much to develop. There are eight strings of tools at work. The oil is 52 gravity and commands a 10-cent premium over the Pennsylvania grade. The old fields of New York, Pennsylvania, West Virginia, and southeastern Ohio, report nothing out of the ordinary.

Central West

Wood County, Ohio, shows a 105-barrel well in the Underwood Oil Company's No. 5 Brown, Section 26, Plain Township, an old field. Shortly before, in Section 26, the Progress Oil Company finished a 100-barrel well, its No. 9 Case & Case. In Indiana an interesting development was Perry Andrews' No. 1 Ida B. Doty, Section 29, Harrison Township, Knox County, a semi-wildcat which started at 40 barrels at 1,860 feet. In the old Trenton Rock Field, George P. Mertz finished a 60-barrel well in No. 2 Michaels, Section 15, Delaware Township, Delaware County. In Section 27 a dry hole was abandoned the same week. Two important wells in Illinois were completed in Martinsville Township, Clark County. Wyan and others' No. 11 Carper, Section 30, is a 75-barrel producer and No. 12, a 50-barrel well. In the Centralia Field, Marquis and others finished a 50-barrel well in Section 19. Dry holes in Bradley Township, Jackson County, and Wabash Township, Wabash County, put a dampener on two prospective pools. Eastern Kentucky showed few completions. The Union Gas & Oil Company finished a 50-barrel well in No. 10 George Kelly and a 60-barrel well in No. 8 Fyffe, in the Johnson-Magoffin Field.

Western Kentucky

In western Kentucky, Makeever Brothers' No. 20 Sandidge, in Warren County pumped 25 barrels the first four hours. Other fields show average producers. The whole field is busier than at any time for many months and a large number of machines were being moved to leases to start new work. Wildcat news from Mississippi and Alabama is included in the report from this territory.

In Wyoming Field

The Teapot dome in Wyoming developed two water wells. The Mammoth Oil Company's No. 18 in Section 27-39-78, at 3,033 feet, top of the Wall Creek sand and No. 48, in Section 14-38-78 in Wall Creek sand, topped at 3,230 feet. The company completed a 125-barrel well in No. 42, Section 3-38-78. It is a half mile northwest of the center of the structure.

Mexico

The Panuco and Ebano Pools in Mexico furnished the best wells of the week in that field. The Transcontinental Oil Company's No. 9 on Lot 4, in the

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SATISFYING THE NAVAJOS

It is likely that the controversy between the Navajo Indians of New Mexico and Secretary of the Interior Albert Fall, has been brought to an end by the appointment of Herbert J. Hagerman, former Governor of New Mexico, as commissioner to the Navajos. Governor Hagerman has accepted the commission and has begun an inquiry into laws, regulations of the Interior Department and conditions on the reservation.

Representatives of the Navajos recently charged that Secretary Fall was not acting for the best interests of the Indians in the awarding of oil and gas leases to their lands, and charged also, that the Standard Oil Company was being given preference over other concerns and against possible speculation of promoters. These charges drew a heated answer from Secretary Fall and this was made shortly after the appointment of Hagerman.

Secretary Fall says that under a treaty of 1868, it was agreed that property in the Navajo reserve should not be alienated, except by consent of two-thirds of the Indians and that an Indian agent should be appointed for the tribe. No such agent was appointed, but the reservation was divided into five districts with a school superintendent designated as the agent in each district.

"We found," says the Secretary, "that applications for leases were being forwarded to Washington, upon initiation of Indians of one district, and with no action by the tribe of Indians of the other four districts. The Navajo Indian reserve covers portions of Arizona, New Mexico and Utah.

"For the purpose of preventing difficulties between the different clans and Indians of the different districts, and for the purpose of insuring rights of all Navajos, numbering approximately 30,000, to the proceeds of oil, or of any other mining leases or developments, the plan was worked out under which ex-Governor Hagerman of New Mexico, was appointed commissioner to the Indians, following the treaty terms.

"Leases must be made by the Secretary of the Interior. He can not be compelled by any other authority to make them.

"The Department has had trouble upon at least one other reserve where parties have sought to corrupt an Indian council. A lease that was properly initiated was approved by the secretary and was developed to the discovery of the only oil on the reserve. Other parties secured other leases upon the same ground, through a majority of the council, and a demand was made on the Secretary by such majority to recognize the second lease and deprive the first and legal lessee of the results of his expenditures.

"Such practices have resulted in the practical stoppage of oil development upon the great reserve in question. We expect to avoid the difficulty and to prevent litigation in the future by the policy that is being worked out."

Secretary Fall says he believes that criticism of his administration was dictated by interested parties who have been unsuccessful, or expect to be unsuccessful, in securing from the Indians of one district lease rights to lands which are the property of the entire Navajo tribe, without consideration or approval of the Navajo tribe.

"I am not surprised," he says, "that speculators whose plans are interfered with should rave and engage in personal abuse."

MORE DEMAND FOR TANKERS

The United States Shipping Board and private corporations owning oil tankers report a greatly increased demand for this type of vessel, due largely to the rapidly growing policy of shipping California crude and fuel oil to North Atlantic ports. The falling off in shipments from Mexico is a contributing factor in this situation, which has helped solve the problems confronting oil operators in southern California, where the production has been greater than could conveniently be cared for. It goes without saying, also, that the United States Shipping Board and other concerns having tankers have welcomed the greater demand for vessels.

The Government has 78 tankers, 21 of which are now in service, with indications that many more will be placed in operation within a short time, as the chartering market for tankers is very active. The chartering rate at present is 80 cents a barrel, an advance of 20 cents a barrel over the rate of last summer and 10 cents higher than the rate last fall. The average tanker has a capacity of 60,000 barrels, although a number of the Standard Oil tankers have a capacity of 140,000 barrels. It is said it will only be a short time until all privately owned tankers are in operation, an evidence of this being the fact that the Atlantic, Gulf & West Indies Steamship Company recently chartered a number of such vessels for the California-North Atlantic coast trade and its entire fleet of 12 vessels is now in operation.

During January, approximately 1,080,000 barrels of crude and fuel oil were transported by tanker from Los Angeles to Philadelphia and New York alone, while the Shell Oil Company sent 200,000 barrels of fuel oil to Balboa for diversion upon arrival there. Many tankers which formerly operated between Mexico and New York have been diverted to the California and North Atlantic coast trade.

SWAT THE PIPE BOOTLEGGER

Taking advantage of the present prosperous outlook in the petroleum industry when rising prices of crude are stimulating development work and when the building of numerous pipe lines throughout the country has so taxed the capacity of mills that operators are finding it increasingly difficult to obtain needed pipe and casing, the pipe bootlegger, or illegitimate dealer in pipe, that is, an out-and-out profiteer, has again started to conduct his nefarious trade. The oil industry, especially in the Mid-Continent territory, has not forgotten the experience with bootleggers of tubular goods in 1920, when these parasites mulcted thousands of dollars from operators and caused a situation in Oklahoma which resulted in a general uprising among purchasers of pipe and vigorous action by the Tulsa Purchasing Agents' Association, which represents the majority of big Oklahoma operators.

One bright spot in the present situation, however, is the fact the experience of two years ago will permit quick action now, and that the pipe mills have offered their co-operation in stamping out bootlegging. Two years ago, the question which puzzled operators most was the fact that while pipe bootleggers seemed to have large quantities of various sizes and makes of pipes, representatives of the manufacturers of these tubular goods asserted the mills were unable to supply the trade. Now, with the hearty co-operation of the mills and their representatives in the oil territory, the bootlegging evil can be quickly stamped out if operators themselves aid in the effort.

The Tulsa Purchasing Agents' Association, which deserves great credit for the success of the efforts waged against illegitimate dealers before, is taking a leading part now in endeavors to protect operators from abnormal costs. It has asked that every purchasing agent approached by a pipe bootlegger immediately notify the secretary of the association at Tulsa. The secretary then will wire the bona fide mill representative of the pipe offered for sale. The association also will trace the source of the illegitimate dealers' supply, as, it is said, once it is known where the bootleggers get their tubular goods, the fight against them will be half won.

The success of the efforts to stamp out this evil rests largely with those who buy pipe. If they are consistent in their co-operation with the Tulsa Purchasing Agents' Association and keep the secretary of that organization fully informed as to offers made by bootleggers, quick results may be expected. If the mill representatives carry out their part, the battle will be won. Success of the movement means a saving of thousands of dollars for the operators.

A CHALLENGE TO PRODUCERS

The American oil industry will be called upon this year for 2,000,000 barrels of crude per day. That is the estimate of the needs of the refining industry made by eastern oil executives recently interviewed, and the question naturally arises, where is it to come from? It is a vast quantity of production. The average marketed production in 1922 was approximately 1,510,000 barrels a day. At present the production of all the fields in the United States is 1,830,000 barrels a day, with California producing close to 600,000 barrels a day and the fields east of it showing an output of around 1,239,000 barrels. Our imports are 250,000 barrels a day, which gives us over 2,000,000 barrels, of which we are exporting about 35,000 barrels. But there is no assurance that we will maintain our present production. The tremendous output of the new closely-drilled California fields is flush. It appears not to have reached its crest, but the year is very young and the fields are being drilled as rapidly as the great depth of the sands and the difficulties surrounding California drilling will permit. What California production will be by midyear is purely guess work. Oklahoma, the second producing field, is putting 435,000 barrels a day on the market, much of which is high-grade oil. It's January output exceeded that of December. The development of Tonkawa has resulted in more than enough crude to offset declines in other Oklahoma fields, and with the development this year of the territory lying between the Burbank Field and the new Kaw Field, or Burbank extension, the production of Burbank is expected to greatly increase over its present output, which has fallen from 991,000 barrels to around 72,000 barrels. There is only one field in the United States that can, if given the opportunity, quickly increase its production, and that is Wyoming, and for a year to come it will have no pipe-line outlet to the East. Wyoming can do 175,000 barrels a day—perhaps 200,000 barrels—but it is permitted to produce only 80,000 barrels. The stocks of crude which loom large may go fast if the demand is as large as the estimates put on it, in which case crude prices will go to a point where many operators can afford to invest their surplus in wildcat work, and if history repeats itself, this will mean new fields and new big production sufficient to meet demands, or to exceed demands.

REMARKABLE MOTOR CAR OUTPUT

The automobile industry is a veritable wonder in our present day economic and business make up. The output of cars for 1922 shattered all records, and January, 1923, started off with an output 126 per cent in excess of that of January, 1922. There is a car for every 10 inhabitants, or thereabouts, in the United States and the percentage is steadily mounting.

The Sunburst Oil Field of Montana

A New Oil Region With Big Prospects is Reviewed by Well Known Geologist and Operator. Rush Expected in Spring.

With the approach of spring, the desire for information on the new oil fields of Montana is increasing. There is not the least doubt that many men interested in the production of petroleum will visit the Montana fields as soon as the winter breaks and most of them will go into Toole County, where the Kevin-Sunburst Field lies and where one of the largest geological structures on the Continent underlies the surface. Dorsey Hager, geologist and oil operator, at last week's meeting of the American Institute of Mining and Metallurgical Engineers in New York presented a paper on "The Sunburst Oil and Gas Field, Montana." Mr. Hager is an enthusiast on the subject of that field. He is an executive officer in operating companies there, which may account for some of his enthusiasm, as it is perfectly natural for one to believe in the potentialities of that in which his money is invested and to which his time and talent are given. Mr. Hager's paper covers the situation in Sunburst quite thoroughly. Generous extracts from the paper are here given:

One of the most interesting fields in North America was discovered, early in 1922, near the towns of Sunburst and Kevin, Toole County, Montana. This field produces oil from the Jurassic beds, which heretofore have been of but little importance as oil producers, and promises to be the largest single oil pool, in areal extent, opened on this continent. Attention was called to this field early in 1922, but the developments of the summer and fall show its possibilities. Sunburst, the main town at the north end of the field, is growing into a substantial center for oil-field workers. Shelby, the county seat of Toole County, is the center for the field officers of most of the companies operating in the field. Great Falls, the largest town near the field, has a population of 25,000, and is the central point for the oil companies operating in the northern part of Montana.

The Sunburst Field is located in the northern part of Toole County. As the producing area is just 11 miles south of the Canadian boundary this field is the farthest north in the United States. The towns of Sunburst and Kevin, on a branch line of the Great Northern Railway, are 3 to 6 miles from the producing area, and the town of Shelby, on the main line of the Great Northern Railway, is 5 miles southwest of the southernmost well in the field, the Ohio-Berg in Section 6, Township 32 North, Range 1 West.

History of Field

The first well in the Sunburst Field was drilled in Section 16, Township 35 North, Range 3 West, by the Gordon Campbell-Kevin Syndicate No. 1, March 14, 1922. Oil was found at 1,770 feet in the basal Ellis formation of Jurassic age. The well was reported as good for 100 to 1,000 barrels, but developments prove it good for 5 to 10 barrels of 30 degree gravity oil.

The second well, in Section 34, Township 36 North, Range 2 West, was completed June 5, 1922, by the Sunburst Oil & Gas Co. This well produced 100 barrels of 36 degree oil, at a depth of 1,545 feet, in the basal Kootenai formation of Cretaceous age, and augmented the boom in the field. The active entrance of the Ohio Oil Company into the field, June, 1922, started a vigorous development campaign. One of the important wells is the California-Morton* well in Section 13, Township 34, Range 2 West, completed in the Ellis sand at a depth of 1,373 feet, which extended the field 9 miles south of the Sunburst discovery well. Completion of the Ohio-Berg well in Section 6, Township 32, Range 1 West, 9 miles south of the Morton well, as a 7,000,000-foot gasser, has opened possibilities 18 miles south of the northernmost wells.

*The California Co. is a subsidiary of the Standard of California.

*Brought up to date when proof was revised.

The rapid development of the field is shown by the number of companies, and their holdings. The best part of the field is now largely in the hands of a few concerns, which are holding the field for economical operations.

Companies Operating in the Field

Company and Class—	Acres
Black Magic Co., Independent	320
California Oil Co., Standard of California	15,000
Carter Oil Co., Standard of New Jersey	3,000
Campbell Syndicates, Independent	15,000
Franklin Oil Co.	160
Kalispell-Kevin	4,000
Hager-Stevenson Oil Co., Independent	12,500
Mid-Northern Oil Co., Standard	3,000
Ohio Oil Co., Standard	20,000
Gypsy Oil Co., Independent	20,000
Gladys Belle Oil Co., Independent	640
Homestake Co., Independent	3,500
Hogan and Associates, Independent	2,000
Shaffer Oil Co., Independent	320
Sunburst Oil and Gas Co., Independent	45,000
Troy-Sweetgrass Oil Co., Independent	20,000
Three-in-one Syndicate, Independent	1,000
The Texas Oil Co., Standard	2,000
Waite Oil Co., Independent	160
Western Petroleum Exploration Co., Independent	3,000
Individuals and other small companies, Independent	40,000
Total	169,320

The development of the field has been rapid. Over $2,500,000 has been expended in leases and in development, which to January 20, 1923, was:**

Producing wells	29
Commercial gas wells	6
Acknowledged dry holes	6
Holes that may be shot into production	4
Idle wells	2
New locations	33
Drilling wells	30
Total	110

Status of Lands

There are three classes of lands in the area: Patented lands without mineral reservations; unappropriated government lands without minerals reserved to government; State lands. Titles to the patented lands are more or less complicated by mortgages and back taxes; however, the purchase of royalty interests has enabled many of the patentees to clear their lands of obligations. The bulk of the land is patented. Patented lands with mineral reservations are obtained under the Federal Leasing Act of February, 1920; all this land, about 30,000 acres, has been taken up.

The Montana State lands comprise Sections 16 and 36 in each township, and sites selected for State institutions. These lands are subject to lease from the State; all of them have been secured. As a whole, the patented land titles are good except for the heavy encumbrances, which will be cleared by the landowners or by oil companies in protecting their rights.

Untested Areas

Not a single test hole has been completed in Township 35 North, Range 1 East, 33 North, Range 2 West, 33 North, Range 1 West, 33 North, Range 1 East, and 32 North, Range 1 West. Two holes have been drilled in Township 34 North, Range 1 West. One of these was a 1½-inch diamond-drill test, the Troy-Sweetgrass well, which showed oil but was never put on the pump. These townships are structurally as well located as other producing area and there is no reason why production should be absent from them. In at least three full townships no adequate test hole has been completed to date. These townships are just as well located, structurally and stratigraphically, as other areas on the dome that are now producing oil.

Commercial Wells

The oil wells produce from two horizons, the Kootenai and the Ellis. Kootenai wells that are producing oil are the original Sunburst discovery well, in Section 34, Township 36 North, Range 2 West, the four Davey wells, and two Swazey wells in the same section. The Homestake-Reibe No. 1 and the Davey No. 2, in Section 3, Township 35 North, Range 2 West, range from 35 to 70 barrels at a depth of 1,540 to 1,560 feet. The California-Newman well, in Section 23, Township 35 North, Range 2 West, is pumping at 1,250 feet, and produces 30 barrels per day.

One mile south of the Campbell well, in Section 16, Township 35 North, Range 3 West, the Black Magic has recently encountered commercial production in the Ellis horizon, although the well is about 40 feet higher structurally than the Campbell but about 30 feet lower than the Lewis gas well in Section 14, Township 35 North, Range 3 West, which did not obtain commercial oil. In Section 18, 2 miles east of the Lewis well, is the Gladys Belle, which had an initial production of 200 barrels. After 60 days' run, that well is producing 65 barrels per day; it is 6 feet in the Ellis oil horizon. The other wells in the Ellis horizon are average. The California-Morton well is near the top of the dome in Section 13-34-1. This well showed dry sands in the Kootenai and had a production in the Ellis horizon of 25 barrels; however, a new well west of the California-Morton and one east, were both seemingly dry in the Kootenai horizon, as well as in the Ellis horizon.

Some of the wells in the northern end of the field, in Sections 34 and 35, Township 36 North, Range 2 West, and Sections 2 and 3, Township 35 North, Range 2 West, commonly known as the Sunhio group, produce from both the Kootenai and the Ellis horizons. The oil in the Kootenai horizon is of better grade than that in the Ellis, but the quantity does not justify separate tank facilities.

Shooting of Wells

Most wells on this dome should be shot in both the Kootenai and the Ellis horizons; shooting has benefited all the wells in which it has been tried. The first shooting was with 20-quart charges, which were too light. The Hannon and Zimmerman wells, however, showed increased production with these light charges. Davey Nos. 3, 4 and 6, and the Swazey No. 2 drilled in the Kootenai and the Ellis sands, were shot into good wells with 40-quart charges. Davey No. 5 had a 40-quart charge for each sand. The Homestake-Riebe No. 1, which had only a showing, was shot with 100 quarts in the Kootenai sand, and is a 40-barrel well. The Thornton No. 2, in Section 17, Township 35 North, Range 2 West, was shot in the Ellis sands with an 80-quart charge and now produces 50 barrels or more. Charges of 80 to 100 quarts in all new wells producing less than 50 barrels are justified by the results so far obtained by shooting.

Expectancy of Production From Wells

From present operations, it is difficult to say what the wells should produce. Wells in the Kootenai horizon, with a body of sand 15 to 20 feet thick, should produce at least 4,000 barrels per acre, or 32,000 barrels per well, with one well to each 8 acres. This estimate is conservative.

It is hard to estimate the production for wells in the Ellis horizon, like the Gladys-Belle, Mid-Northern and Hogan, which started at 200 to 450 barrels each. The oil horizon is from 5 to 20 feet thick. Such wells should produce not less than 20,000 barrels the first year, and be good for 60,000 barrels for their first 10 years of life. This means 6,000 barrels per acre, where one well is drilled per 8 acres, which will be good practice.

These estimates are largely assumptive, especially as only one well has produced over 5 months. That well, the Sunburst discovery well, produced initially 100 barrels per day and is now producing 45 barrels per day from the Kootenai sand. The Gladys-Belle No. 1 has produced for 60 days from the Ellis sand and produces 65 barrels at present. The Mid-Northern well has produced over 225 barrels per day for 45 days and shows no diminution in output. After 35 days, the Hogan well is producing 450 barrels, which was its initial flow. These wells have not been affected by offsets and so do not give a true index of conditions.

The results of drilling and the geological evidence lead to the belief that a full township of oil-producing land has been fairly well blocked out in the northern end of the field. A township com-

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312055

MEN KNOWN IN OILDOM

ANDREW C. McLAUGHLIN

Andrew Cyrus McLaughlin, president of Chamber of Mines and Oil, California, was born August 5, 1875, in Austin, Texas. He is the son of Dr. J. W. McLaughlin, M. D., at one time professor of medicine in the University of Texas.

He received his education in the public schools of Austin, entering the University of Texas in 1892, and graduating with the degree of Bachelor of Science in 1896. He then pursued post-graduate studies in geology at Johns Hopkins University from 1896 to 1899.

During his student days, he was assistant on the Texas Geological Survey and the United States Geological Survey. After graduation, he served as a geologist on the geological survey of Missouri from 1899 to 1900.

Upon the discovery of oil at Beaumont, he returned to Texas in 1900, taking the position of geologist with the Houston Oil Company of Texas. From 1902 until December, 1906, he became identified with the refining industry, first serving as superintendent of the Southwestern Oil Company's refinery—a subsidiary of the Houston Oil Company—advancing from superintendent of the refinery to manager of the operating department, and finally to the position of assistant to the president of that company.

He resigned in December, 1906, to go to California, where he took service with the Southern Pacific Company. It was at this time that the old Kern Trading & Oil Company, a subsidiary of the Southern Pacific Company, decided to enter into an extensive development program for the purpose of supplying fuel oil to the railroad. Mr. McLaughlin was appointed superintendent of operations of the Kern Trading & Oil Company. He served with this company during the development of the property from its beginning until 1918, when he was transferred to the Associated Oil Company as vice-president and general manager. Subsequently, with the organization of the Pacific Oil Company, he was made vice-president of that company.

Mr. McLaughlin was elected a director of the Chamber of Mines and Oil for 1920, and vice-president for 1921 and 1922.

PERSONAL PARAGRAPHS

J. A. Howard, of Chatham, Ontario, is inspecting the fields in Wyoming in the interests of Canadian capital.

• • •

R. B. Miller, of the Miller Petroleum Company, of Kansas City, is in the East on an extended business trip.

Ray Williams, formerly connected with the Midwest Refining Company, with headquarters at Casper, Wyoming, has accepted a position with the Louisiana Oil Refining Corporation.

• • •

Edward Raydure has returned from his Bowling Green, Ohio, home to the Burkesville Field, of Cumberland County, Kentucky, where, with his father, W. S. Raydure, he has valuable holdings.

• • •

John Hogan has returned to Casper, Wyoming, after a trip of two months' duration to his old home in Olean, New York. Mr. Hogan came to Casper from Lethbridge, Canada, and is to locate there permanently.

• • •

William Polham and C. J. Webster, officials and members of the board of directors of the North American Oil Company, have been inspecting the properties of the company and its subsidiaries in Oklahoma.

• • •

Henry L. Phillips, president of the Sinclair Crude Oil Purchasing Company, with offices in Tulsa, is now at the New York headquarters of the Sinclair interests. He is expected to return to Oklahoma in about a week.

• • •

Minal Young, general manager of the New York Oil Company, has returned to Casper, Wyoming, from New York after a two weeks' visit on business matters connected with the New York Oil Company's interests.

• • •

C. D. Kenn, widely known among oil men, was elected president of the Shreveport Producing & Refining Company, at a recent meeting of the stockholders of the company. Bradford Hearn was elected secretary.

• • •

A. P. Morrison, of the Kanotex Refining Company, of Arkansas City, Kansas, was a recent Kansas City visitor. He said that while the demand for gasoline is good, considerable of the output is being stored by the refiners.

• • •

George J. McManus, of Dallas, Texas, has been looking over the Johnson's Bayou section of Cameron Parish, south Louisiana, where some development work has been done in the past and more is scheduled for the near future.

• • •

R. W. McIlvain, vice president of the Pure Oil Company and president of the Oklahoma Producing & Refining Corporation, has returned to Columbus, Ohio, after spending several days at the Tulsa offices of the two companies.

• • •

Nat Baker, mayor of Lusk, Wyoming, and a well known figure in affairs of the Lance Creek Field, was in Casper, Wyoming, during the past week transacting business looking to the drilling and development of territory in the Lusk region the coming spring.

• • •

A. C. Anderson, who was one of those in charge of constructing the gasoline absorption plant for the Producers & Refiners Corporation near Casper, Wyoming, is now located at Breckenridge, Texas. He is employed by the Hope Engineering & Supply Company.

• • •

J. B. Pierce, of Elizabethtown, Kentucky, and one of the pioneer oil operators in Cumberland County, Kentucky, is at Burkesville, Kentucky, looking over his holdings. He expects to start development work as soon as the high waters recede and the roads become passable.

• • •

O. V. Borden, who recently resigned as secretary of the Tulsa Purchasing Agents' Association, was presented with a platinum and green gold watch last week at a meeting of the association. The gift was in appreciation of Mr. Borden's work for the association while secretary.

• • •

W. A. Miller, president of the Illinois Pipe Line Company, has returned to the Findlay, Ohio, offices after a visit to Wyoming points. The trip was made in connection with the plans of the Illinois company to construct an 8-inch line from the Salt Creek Field in Wyoming to Bucknum.

B. C. Averill, who has been connected with the sales department of the Magnolia Petroleum Company for seven years, has resigned to go with the Pure Oil Company. He will have charge of sales in Indiana, with headquarters at Lafayette, Indiana.

• • •

J. H. Miller, president of the Miller Petroleum Company, Kansas City, is now back at his business in Kansas City, after having spent several days in Chicago recently en route home from Washington, where he appeared, with other western refiners, before the Senate's investigating committee.

• • •

H. W. C. Prommel, for the past five and one-half years associate geologist with the petroleum engineering firm of Fisher & Lowrie, at Denver, Colorado, has opened offices in Denver as consulting geologist and will make his specialty the examination of prospective and producing oil fields.

• • •

W. W. Orcutt, vice president of the Union Oil Company, has returned to the Los Angeles offices of the company after a visit to the Wyoming and Montana fields. He was accompanied on his trip by J. M. Douglas, geologist of the company, and C. S. Sherman, in charge of the company's producing operations in that section.

• • •

F. W. Fraley, formerly drilling superintendent for the Humble Oil & Refining Company in the Gulf Coast pools, but now an independent operator, has been investigating the Webb, Zapata, Jim Hogg and Duval Counties prospects. Mr. Fraley believes better wells will result from deeper drilling in the present producing districts in Webb and Zapata Counties.

• • •

Grant T. Stebbins, president of the Gladys Belle Oil Company, is in the Smackover Field of Arkansas, where his company has an extensive development program under way. The pipe line which the company is constructing from its production to the Ouachita River is about completed. The company plans to barge its oil to New Orleans from the river end of the pipe line.

• • •

M. N. Davis, sales manager of the S. R. Dresser Manufacturing Company, of Bradford, Pennsylvania, was a Tulsa visitor last week and the fore part of this week. Mr. Davis came to Tulsa from Wyoming points where he also spent several days. Mr. Davis said there are excellent prospects for several gas lines in the Wyoming-Montana area in the near future. He spoke optimistically of general business conditions, especially within the oil industry.

• • •

R. L. Waldi, formerly in charge of the refinery of the Southern Oil Corporation, at Walters Oklahoma, has been placed in charge of the refining and pipe line interests of the Skelly Oil Company, at Burkburnett, Texas. A refinery known as the Nortex Refining Company is operated at Burkburnett. Mr. Waldi is widely known in refining circles of north Texas. He was at one time connected with the Lone Star Oil & Refining Company at Wichita Falls, Texas.

• • •

T. F. Hudgins, for a number of years in charge of sales of heavy machinery in the Mid-Continent territory for the National Supply Company, has been appointed manager of sales in the Mid-Continent for the C. & G. Cooper Company and has opened a new office of the company at Tulsa. Heretofore the company did not have a Tulsa office, handling most of its Mid-Continent trade from its Dallas, Texas, office. A stock of repair parts will be carried in the Tulsa office. The company now is specializing in four-cycle direct connected gas compressor units.

• • •

The Lubrite Refining Company has secured the services of D. A. Windsor as superintendent in charge of its light oil department. Mr. Windsor assumed his new duties February 15, coming to the Lubrite Refining Company from the Pure Oil Company's western refining division, where he held the position of assistant superintendent of the International refinery at Cushing, Oklahoma. Mr. Windsor is a graduate of Marietta College and has had a broad experience in construction and light oil refining, having been with the American Bridge Company for five years and in the refining division of the Pure Oil Company for a like period.

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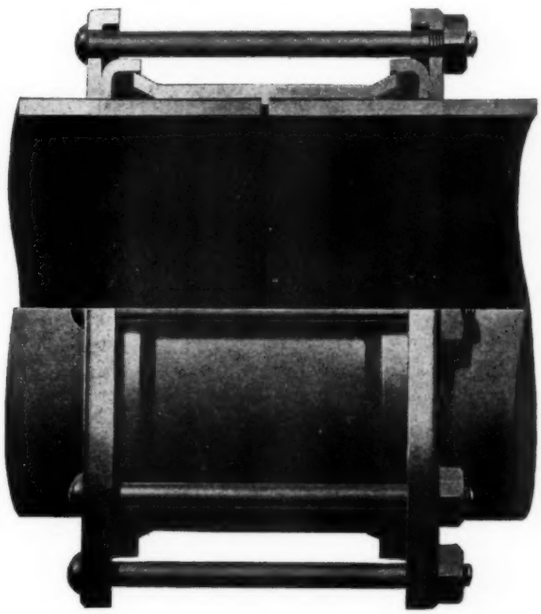

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S. R. DRESSER MFG. COMPANY
BRADFORD, PENNA., U. S. A.

DRESSER - COUPLINGS - DOMINATE

City Conveniences For Field Employes

Comfortable Homes With Large Lawns, Plenty of Entertainment and Absolute Cleanliness Characterize Carter Camp in Burbank.

By Andrew M. Rowley

There is an expression current through the oil fields among a large part of the oil men, regardless of which company they may be associated with that "you can tell a Carter camp the minute you see one." This is due to the general type of buildings used by the Carter Oil Co., the manner in which these buildings and houses are erected, the absolute cleanliness of the camp and field and the modern improvements embodied in all houses, buildings and developments. The boarding in of the steel derricks from the derrick floor to the crown block, on wells drilling near the camp site, is but one evidence of the care taken to keep the camp clean and free from the oily mud and grease which might result if the oil sprayed over the ground or on the buildings.

The houses erected for those employes having what is termed "permanent positions" such as pumpers, farm bosses truck drivers, warehouse men, gasoline plant men and others who work daily and whose work is such as will continue steadily, are substantial and comfortable in every way and equipped with all modern improvements. These dwellings range in size from three to five rooms and bath. Each is made of good lumber prepared in the company's own mill at Tulsa and shipped to the field in sections ready for erection. The interior of the house is lined with Beaver board and the whole structure is weather proof and warm. The roofing is of rubberoid.

Houses Strictly Modern

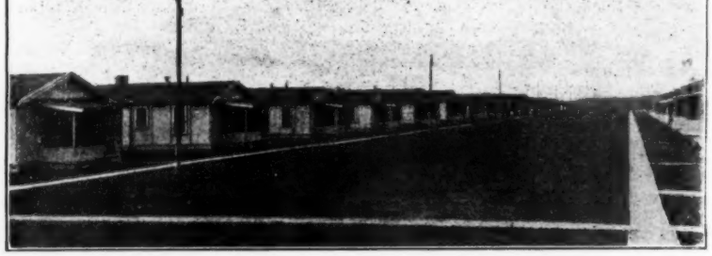
Each house has bath, hot water heater and hot and cold running water. Each room is piped for natural gas and wired for electricity, and the house, water, all electricity and gas are supplied free to the employes. Each house is located on a large lot, there being a distance of approximately 30 feet between each two houses. Cement walks lead to the houses which have screened porches in the front and rear. Other cement walks extend along in front of the houses for the whole length of the "street." This street is wide and is in reality one big lawn as it is sowed in Bermuda grass, which is kept cut and trimmed as a lawn. Concrete walks extend across from one side of this street or parkway to the other at intervals of about 250 to 300 feet. No vehicular traffic is permitted on this street or parkway, the street for wagons and other delivery vehicles being located along the outside of the residence section and to the rear of the houses. These streets are separated from the section of the camp containing the dwellings by fences in which are located turnstiles for pedestrians. Hence, the section of the camp with the dwellings is in reality a park, enclosed with a fence and with roads extending along the fence on the outside. All inside the fence, surrounding the houses, is the lawn.

In addition to the clear and chemically pure water piped to each house and building from the water plant on the Arkansas River at Kaw City, Okla., 9 miles from the Carter camp in the Burbank Field, and the electricity and natural gas with which each dwelling and other building is supplied, additional modern improvements and conveniences, such as are enjoyed in the larger cities have been installed and are available to residents of the camp. These include an extensive sewage disposal system connected with each house and other building, and a garbage disposal plant. The sewage is run into two large septic tanks which dispose of it. The garbage is collected daily by company trucks and carried out from the camp and burned.

Protection from Storms

Located along the rear of the dwellings, back of about every fifth or sixth house, is a large concrete storm cellar, water-proof, which provides a safe haven for all persons in the camp in case of a severe windstorm. These storms, bordering on cyclones, have been experienced in parts of Kansas and northern Oklahoma at times and ample provision has been made for the protection of all life and property in the Carter camp from such storms. As described in the previous article, all derricks are braced and guyed with steel lines embedded in concrete. Every residence in the camp is also guyed with steel lines embedded in concrete. One of these steel wires extends over the front of the house, the ends on each side of the house being embedded in concrete and a similar wire, similarly embedded, extends across the rear of the house, making the structure safe against any ordinarily severe windstorm.

A large lawn extends along the rear of the houses, and located the entire length of the dwelling section of the camp site are two wire lines, drawn taut and braced at intervals with wooden supports. Receptacles are provided for the garbage and rubbish so that a striking feature of the camp is the absolute cleanliness prevalent everywhere. Scraps of paper, pieces of wood, cans or other refuse are conspicuous by their absence, none of these things being seen about the camp. The grass around the houses, both front and rear, and in the parkway which extends between the rows of dwellings, is kept cut and watered so that it is in reality a beautiful lawn during the spring, summer and fall.



Main street of residential section in Carter Camp, in Burbank Field, showing homes for employes, concrete walks and lawn parkway.

Single Men Cared For

For the unmarried employes of the camp having permanent positions, such as the roustabouts or men learning the oil business from the ground up, large, comfortable, and well furnished buildings, generally called bunk houses, are provided, while next to these buildings is located a large bath house for these men. Next to the bath house is a big billiard room, the company having erected the building and turned it over to a reliable man who owns the tables and who operates the hall as a place of clean amusement for the men of the camp who like to play pool or billiards. The company supplies all electric light, gas and water to the hall free of charge and insists that the owner be reasonable in his charges and that he keep his place entirely orderly and clean.

A barber shop is operated in connection with the billiard room and the company has a grocery store on the camp site in addition to a drug store. The grocery store is run on a non-profit-making plan. The company brings all supplies for the store on its own trucks from the railroad towns in the district and sells the groceries at their actual cost, plus a slight percentage for overhead expenses in conducting the store. In order that employes of the company might not feel there was any desire upon the part of the company to force them to make their purchases at the company store, permission was given a grocer to erect a store at the entrance of the camp site, and this man has a well stocked place and does a fair business.

The drug store is the property of Dr. Chambers, the company physician at the camp. Dr. Chambers attends all employes of the company and his services, in case an employe meets with an accident, are without charge to the patient. He resides in the camp and is readily available at all hours of the day or night. In addition to the stores mentioned, deliveries are made daily to the camp from Shidler, De Noya, Burbank and other towns in the district by merchants, laundries, dairies and other business firms.

Precautions Against Fire

Every precaution is taken to guard against fire in the camp and on the entire property. Chemical fire extinguishers are located at strategic points over the property while at the main camp, in the dwelling section, a water line is run the length of the camp with plugs at convenient intervals and regulation fire hose in 150-foot lengths housed in small sheds. The water connections are covered in such a way as to be easily accessible and still protected against cold weather to prevent their freezing. In addition to the water lines, two 40-gallon chemical containers on wheels are located in the dwelling section in houses so that they may be procured quickly and run to the scene of any fire. Similar fire precautions are taken at a small camp of the company located some distance from the main camp and near the town of De Noya.

Believing that "all work and no play makes Jack a dull boy," the company erected a large building in the camp site and turned it over to the residents for a community center. The building is comfortable and well lighted, and heated in cold weather. The women of the camp have their clubs and other social affairs and use the community house for their meetings. It is also used by them for dances, Hallowe'en, Christmas, Thanksgiving and other seasonal entertainments, for suppers they give at intervals and for lectures and other entertainments. Every evening a concert is given at the community house, the residents of the camp having contributed sufficient funds for the purchase of a $500 radio outfit, which can be tuned in for the concerts, addresses and other features broadcasted by the large sending stations in all parts of the United States.

Boxing Matches Popular

Once a week or so, the men of the camp hold boxing matches in the community house, with a lively rivalry being displayed among the employes of the different farm leases and branches of the work. Practically every division at the camp has its champion boxer and those boxing bouts fill the community house while the ability displayed by the men taking part in the matches so satisfies the critical observers at the bouts, there is no desire on the part of any to go outside the camp to see boxing. Aside from the men especially trained in boxing at practically every match, men who never had on boxing gloves before get into the ring and try their skill. The consensus of opinion after each match is that "a good time was had by all."

Music is an important feature at the camp. The radio concerts are supplemented by piano selections by residents at the camp and these selections usually wind up in a general songfest with everyone joining in, at least in the chorus.

Accident Prevention.

Accident prevention and safety first work is an important consideration at the Carter camp. A special department of the company looks after these matters, and, as a result, it is said accidents have been reduced to a minimum, there having been a great decrease in the number and seriousness of accidents since this department began to function. Officials of this division make periodical visits to the camp and travel over every part of it. These men call attention to details which might be overlooked by others such as nails sticking up in boards where persons must walk; electric lights hung so low as to be at a level of the heads of persons who might come into contact with them; wires strung in places where they might hinder free passage; anything in front of the small sheds housing fire hose or chemical extinguishers which might prevent quick action in getting at these things; and carelessness in handling heavy oil field equipment which might result in injuries to the person handling the equipment and also to those near him.

Arrangements are being made now to provide men working in derricks above the derrick floor with safety belts so that when they are handling casing or tubing, there will be no danger of their falling.

Camp Is Training School

All production men sent abroad by the Standard Oil Co. of New Jersey, the parent company of the Carter Oil Co., are trained by the Carter Oil Co., and the Carter camp in the Burbank Field is where many of these embryonic foreign representatives learn the oil business from the ground up. Some of these are young university men. Others have made a mark in the world outside the oil business, and because of their merit have

(Continued on page 116)

SWAN UNDERREAMERS

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"The Pipe Always Follows the Swan"

The Producing Record of a Great Field

Up to First of Year Burbank Output Was 29,126,366 Bbls. a Per Acre Recovery of 2,493 Bbls. Future Potentiality.

By J. B. Gambrell

While Tonkawa, with its spectacular characteristics of seven producing horizons, all of which produce exceptionally high grade crude and unrestricted drilling campaign, which, it is conceded, will make it the titular producing area of Oklahoma within the next 30 days, has tended to temporarily distract attention from the Burbank Field, the gateway of northwestern Oklahoma, this field being developed under conditions peculiar to Osage regulations, has among its records achievements which make many of the major purchasing and producing organizations look upon it as the most important Oklahoma discovery in years, from the viewpoint of a future crude supply of light oil over an extended period.

Opened in May, 1920, by the Marland Refining Co.'s test in the northeast quarter of 36-27-5, western Osage, this field, the first light oil pool discovered in Oklahoma of any industrially-wide consequence since Cushing, has produced up to January 1, 1923, (authentic production records of which are just now available) 29,126,366 bbls. Basing this total upon the number of producing tracts at that time, 73, of 160 acres each, this field shows a per acre recovery during the 32 months period of its existence, of 2,493 bbls. While these figures of the recovery per acre are no index of the field's productivity on account of the fact that it has been developed slowly with only a limited number of tracts offered at the periodical Osage sales, data on some of the leases which have been developed over a considerable period of time gives an interesting insight into the longevity and consistency which may be expected from this field.

Million-Barrel Leases

The most prolific and consistent producing tract in the entire area during the period under consideration has been the Gypsy Oil Co.'s lease in the northeast quarter of 31-27-6. This tract which first entered the production column in January, 1921, has produced in the 2-year period a total of 1,192,447 bbls., or a per acre recovery of 7,453 bbls., and during the month of December, 1922, was still producing at the rate of 25,756 bbls. monthly.

The second largest producer of the field, from the standpoint of recovery per acre, is the northwest quarter of 31-27-6, owned by the Producers & Refiners Co., which offsets the Gypsy's premier producer. This tract began producing in November, 1920, and up to January 1, 1923, had yielded a total of 1,106,510 bbls., or 6,916 bbls. per acre. These two tracts are looked upon by oil men generally as two of the best tracts in the entire field, having enjoyed the advantage of being developed in the early stages and many operators estimate their ultimate recovery in the neighborhood of 15,000 bbls. per acre. Several other tracts, however, have produced very nearly as much oil and may eventually exceed the record of the Gypsy's and Producers & Refiners leases.

Notable among the larger producers are the Marland Refining Co. and others' discovery lease, which opened up the field. Since May, 1920, it has produced a total of 938,358 bbls. or 5,865 bbls. per acre; the Prairie Oil & Gas Co.'s tract in the southeast quarter of 32-27-6, which has produced from March, 1922, till January 1, 1923, 915,032 bbls. or practically the same amount of crude as the discovery well.

While these tracts would indicate an extremely high recovery per acre, they are all located in the northern end of the field, which has proven extremely prolific. The south portion of the area is not so good. Wells in that part of the field come in as light producers and lack the stamina of the northern part. To produce most of them it is necessary to put them on the beam.

Despite the slump in the daily production of the Burbank Field during the past month, due to the fact that most of the development on tracts, with the exception of those sold at the last sale, has been completed, the potentialities of this field are still impressive, though operators believe that it has passed its peak and will never reach the level of about two months ago, when it was giving up approximately 88,000 bbls. a day. The field is not defined on the west, northwest or north, and many officials of the production departments of the larger companies predict that when operations now under way are completed, daily production will hover around the 75,000-bbl. mark for some time to come.

A field survey shows 117 drilling wells, 44 rigs and 13 locations, and according to a leading geologist, who has checked the territory between the Sapulpa Refining Co.'s well north of the Burbank Feld, just over the line in Kay County, which is still making 688 bbls. daily, after a number of weeks, there are at least 35 quarter sections which should prove productive in addition to that now under development. It is estimated that there are 192 locations still to be drilled in the proven area now under lease. These locations, coupled with probably 400 more out of a possible 560 in the 35 quarter sections mentioned above, would indicate a total of 592 more wells still to be drilled. Of the 35 quarter sections which are considered in semi-proven area, 25 lie between the present productive area at Burbank and the Sapulpa well on the northwest and the Marland Oil Co.'s gas well on the west.

Sane Development

Developed sanely by reason of the Interior Department's policy of offering leases only after offset acreage has been developed and then only in tracts of 160 acres each, which prevents the senseless drilling of the town-lot nature, which has ruined so many wonderful fields, the Burbank Field, will, in all likelihood, stand out alone when the final chapter of Mid-Continent oil fields is written from an economic standpoint, considering capital invested, longevity and general scientific production of crude. Substantiation of the belief that this field will prove to be one of the most long-lived in the country is seen in the huge investments the major organizations who control acreage in that area are making in the way of permanent camps and lease equipment. Such concerns as the Carter Oil Co., Gypsy Oil Co., Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Phillips-Skelly interests, etc., have built camps of a permanent character, with practically all of the facilities of a modern city and almost every lease is equipped with the most advanced and efficient type of equipment, representing millions of dollars.

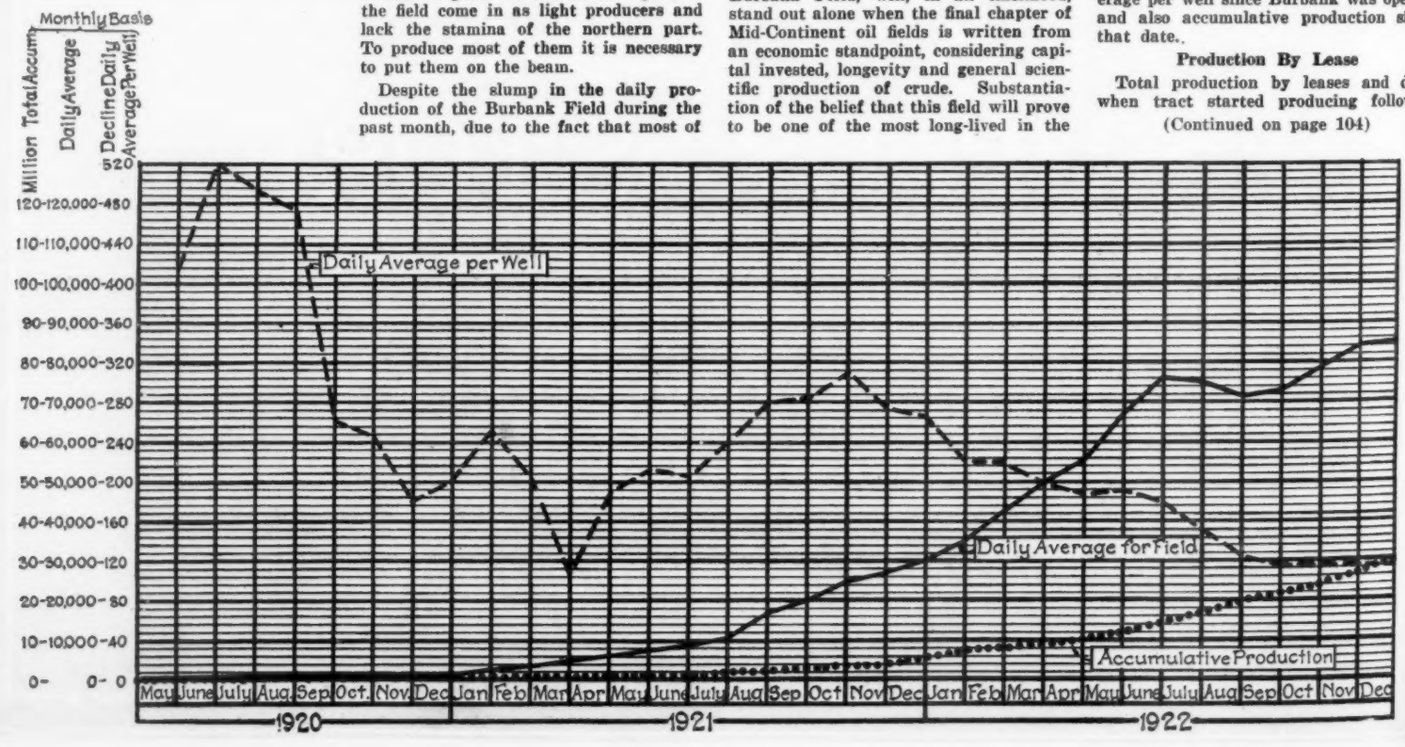
With pipe line facilities of approximately 131,000 bbls. daily and production of 75,645 bbls. with little probability of it exceeding this mark again, the competition for crude is becoming exceedingly keen, with all indications pointing to it becoming more acute. How the desirable connections in this field are looked upon by the major purchasing agencies is best evidenced by the recent action of the Magnolia Petroleum Co. This company, seeking an entry into the Burbank Field, advanced the Phillips Petroleum Co., one of the largest independent producers in the field, what is reported to be $6,000,000 or $7,000,000 upon the agreement of the Phillips organization to turn enough of their crude to the Magnolia to warrant the construction of an 8-inch line into the field by the latter company. Other concerns, with the exception of the Gulf Pipe Line Co., which has all it can do to handle its own production, are showing the same aggressive policy. The accompanying table shows the pipe line status of the Burbank Field with the purchasing agencies, size of line, estimated capacity based upon pumping facilities, length of line and character of territory covered, and average daily runs as of February 21.

The accompanying chart shows the daily average for the field and daily average per well since Burbank was opened and also accumulative production since that date.

Production By Lease

Total production by leases and date when tract started producing follows:

(Continued on page 104)



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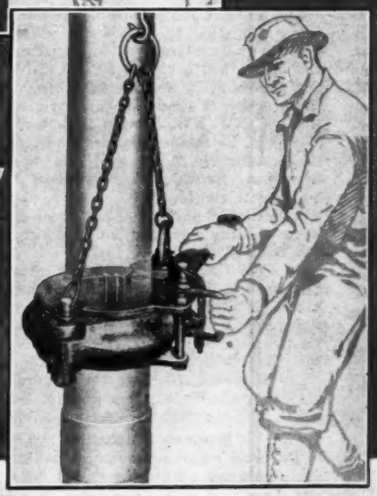

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¶ "Oilwell" Tongs are accident proof—No hooks, catches, or automatic locks are used. Once the Locking Pin is inserted, the Jaws cannot be opened until the pin is removed.

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OILWELL SUPPLY CO

World's Largest Manufacturers of Oil Field Equipment

Oklahoma-Kansas Oil Fields

BY RALPH T. BAKER

Wildcatters becoming more active in Oklahoma because of the better market price for crude. Tonkawa production almost equals that of Burbank, and should exceed it in another week. Waite Phillips extends Burbank Pool westerly. Two good wells in the Wetumka Pool, Hughes County. Much new work started everywhere.

TULSA, Okla., Feb. 24.

With production in the Burbank Field proper dropping to 71,507 bbls. during the week in review and the Tonkawa Field showing an average daily output of 69,616 bbls. during the period, the new light oil pool in Kay and Noble Counties is expected to exceed the Osage Pool in production during the coming week. A lack of new wells of large size and an accompanying rapid decline from flush production has caused a constant decline in the Burbank Field recently amounting to 1,891 bbls. in the pool during the past week, excluding the Sapulpa Refining Co.'s well in Kay County.

During the week in review, Tonkawa showed a gain of 10,521 bbls. as a result of 11 large wells completed during the latter part of the week before. These facts bring the two pools almost to a parallel. Tonkawa, however, is on the upgrade, while Burbank will continue to drop until the new wells on acreage purchased at the last Osage sale are completed.

The quiet tone of the Tonkawa Field during the week in review was more noticeable in view of the large amount of flush production recorded during the previous week. Many wells were standardizing or are preparing to drill into lower sands.

A large number of new rigs were built in the Tonkawa Field during the week, and there was no apparent retarding of operations in the district.

The Prairie Oil & Gas Co. and Wilhoit's No. C-3 Gregory, SW cor. NW SE, Section 5-9-10, was completed as the best well in the new pool near Wetumka, northern Hughes County, making 1,424 bbls. the first 24 hours in sand at 3,379-94 feet. The Carter Oil Co.'s No. 1 Hully, SW cor. SE NE, Section 5-9-10, started off at 30 bbls. an hour after a 10-quart shot in sand at 3,262-81 feet. It gauged 670 bbls. for the 24-hour period ending at 7 a. m. Sunday, and 589 bbls. Monday morning.

The Mid-Kansas Oil & Gas Co. was drilling deeper after bradenheading an 8,000,000-foot flow of gas in sand at 2,530-46 feet in the wildcat in NW cor. NE NE, Section 9-9-11, northern Hughes County.

In southern Okfuskee County, the Minnehoma Oil Co. was plugging back from 2,990 feet, where water was found, to shoot two feet of oil pay at 2,934-66 feet in the test in NW cor. NE SW, Section 16-10-11.

W. C. Newman's No. 1 Barnett, NW cor. Section 31-8-12, was plugging off water at 3,714-15 feet and the well made 105 bbls. of oil during a 24-hour period.

The Waite Phillips Co. completed two wells in Section 35-27-5, extending the Burbank Field one-half mile west. No. 5, NW cor. NE SE, was flowing 250 bbls. No. 6, NW cor. SE, is expected to make a 400-bbl. well after pipe trouble is overcome. Both wells were shot.

South of Okemah, the Cosden Oil & Gas Co. was drilling in No. 1 Bruner, NE cor. SW, Section 21-10-9. Top of the sand was found at 3,130 feet. The test is 3 miles south of production.

Wildcatters Are Active

Spurred on by increasing prices for crude oil and the gradual depletion of areas in the eastern part of the State, Oklahoma operators have turned to western Oklahoma for prospecting in virgin districts. Few regions in the State are being slighted by the activities of the wildcatter in his search for new pools.

In many cases the districts being tested have been gone over carefully by geologists and in many instances even the most conservative companies have purchased favorable acreage near wildcat tests. The belief of some operators that Oklahoma offers the most favorable field for development will be given proof during the remainder of the present year.

Beckham County is leading in the amount of new wildcat drilling, spurred on by the discovery of oil and gas near Sayre a few months ago. The Gant-Rock Oil Co. was drilling at 400 feet in No. 1 Smith, NW cor. Section 6-9n-22w. Simpson and others were rigging up a machine for No. 1, NW cor. SW NE, Section 32-9n-22w. The Emerald Petroleum Co.'s No. 1 Insell, C NE SW NE, Section 7-9n-23w, was rigged up and shut down.

The Rubianna Oil Co.'s No. 1 Thompson, SW cor. NW NE, Section 22-9n-23w, was drilling at 1,300 feet. Martin and others were drilling at 1,518 feet in red beds at No. 1 Martin, NE cor. SE NW, Section 31-9n-23w. The Beckham County Oil Co.'s No. 1 Jordan, CEL SE SW NE, Section 35-9n-23w, was drilling at 2,200 feet.

Wilson & Clay were digging a slush pit for No. 1, NE cor. Section 24-9n-25w. Small and others were building a rig for No. 1, SE cor. SE NW, Section 35-9n-25w.

South of El Reno, in Canadian County, the Radio Oil Co. has a rig up for No. 1 Castle, NE cor. Section 29-11-7w.

In northern Caddo County, Lindsay & Turner were shut down at 1,300 feet in No. 1 Rolf, SE cor. SE NW, Section 19-12n-12w.

Short & Thompson have a rig up for No. 1 Thompson, NE cor. SE SE, Section 12-10n-5w, near Mustang in southeastern Canadian County.

East of Anadarko, in Caddo County, Rucker and others were rigging up a rotary at No. 1, C SW NE SE, Section 24-7n-9w.

At Gotebo, in Kiowa County, Conner & Cluffly were shut down at No. 1 Vogles, CWL SW SW SE, Section 27-7n-16w, at 1,200 feet. Nation & Powers' No. 1, NE cor. NW NE, Section 34-7n-16w, was shut down at 1,750 feet.

In southern Beckham County, Neff and others' No. 1 Barker, NW cor. NW SE, Section 24-8n-23w, was drilling at 900 feet. Sutherland and others' No. 1, SW cor. NE NW, Section 8-8n-26w, was shut down at 2,610 feet.

In southwestern Caddo County, the Glenhoma Oil Co.'s No. 1 Horton, NE cor. SW NE, Section 8-6n-13w, was shut down at 2,372 feet.

In western Kiowa County, the Kiowa Development Co.'s No. 1 was shut down at 977 feet, NW cor. NW SW, Section 33-6n-20w.

In Custer County, the All-American Oil Co. was drilling in lime at 2,850 feet in No. 1 Miller, SE cor. Section 21-14n-17w. In the southeastern part of the county, the Weatherford Oil Co.'s No. 1 Frye, SW cor. Section 24-13n-14w, was shut down at 540 feet. The Hoover Oil Co.'s No. 1, NE cor. Section 34-13n-14w, was drilling at 1,285 feet.

The Trio Oil Co., in Roger Mills County, was drilling at 2,200 feet in No. 1, SE cor. SE NW, Section 3-13n-26w. Maupin and others had a rig up for No. 1 Anderson, NW cor. Section 4-11n-23w.

In Lincoln County, the Pure Oil Co. and the Magnolia Petroleum Co. were spudding No. 1 Kalka, C NW NE SW, Section 18-14-5.

In Caddo County, Rucker and others had a rig up for No. 1, C SW NE SE, Section 24-7n-9w.

The Grady County Oil Co. was building a rig for No. 1, C SE SE SW, Section 23-7n-5w, Grady County. Ramsey and others had a rig up for No. 2 Neely, C SE NW SW, Section 23-5n-8w. The Empire Gas & Fuel Co. had a rig up at No. 1, C NW NW, Section 14-4n-8w. The Magnolia Petroleum Co. was moving in timbers for No. 1, C NW NE, Section 23-4n-8w. Snowden & McSweeney were building a rig for No. 1 Glover, C NW SE, Section 6-4n-7w. Clarke and others were building a rig for No. 1 White, NE cor. SE SW, Section 15-4n-7w.

In Coal County, the Middle States Oil Corporation had a rig on the ground for a test, NW cor. Section 13-6-11.

In Pittsburg County, the Eugenia Oil Co. was drilling at 1,065 feet in No. 1, NE cor. NW NW, Section 28-8-15.

In Jefferson County, the Hadro Oil Co. has staked a location for No. 1 Seay ranch, SE cor. NE SE, Section 33-6s-5w.

Burbank Production

Burbank continued to show a decrease in production, declining 2,449 bbls. in the main field during the week in review to a total of 71,507 bbls. The Sapulpa Refining Co.'s well across the line in Kay County fell from 736 bbls. to 688 bbls.

Production by companies for the week ending February 21 follows:

Company—	Wells	Prod. Bbls.
Carter Oil Co.	130	6,432
Cosden Oil & Gas Co.	46	2,036
Comar Oil Co.	4	411
Devonian Oil Co.	16	654
Lorraine Oil Co.	11	499
Gardner Petroleum Co.	18	1,612
Gypsy Oil Co.	128	18,001
Kewanee Oil & Gas Co.	11	412
Laurel Oil & Gas Co.	13	870
Midland Oil Co.	5	180
Waite Phillips Co.	9	911
Phillips Pet.-Skelly Oil Co.	161	24,061
Phillips Petroleum Co.	1	92
Prairie Oil & Gas Co.	90	4,224
Producers & Refiners Corp.	23	1,083
Roxana Petroleum Corp.	52	1,886
Simons-Moore and others	23	989
Sinclair Oil & Gas Co.	96	5,263
Tidal-Osage Oil Co.	37	1,768
Twin State Oil Co.	4	122
Total	818	71,507
Kay County—		
Sapulpa Refining Co.	1	688
Total	819	73,195

Tonkawa Operations

The Comar Oil Co. has abandoned the location for No. 5-B Endicott, NW cor. SE, Section 34-25-1w. McCaskey & Wentz were drilling deeper in No. 3 McKee, NE cor. NE SW, Section 34-25-1w, which made 340 bbls. the first 24 hours from sand topped at 1,953 feet.

Many new operations have been started in the Tonkawa Pool. The Cosden Oil & Gas Co. and the Marland Refining Co. were building a rig for No. 1½ school land, SE cor. SE NE, Section 33-25-1w. Same operators have a cellar dug for No. 6, SE cor. NE NE, same section. The Blackwell Oil & Gas Co. was building a rig for No. 4-A McDaniel, SE cor. SE NE, Section 34-25-1w, and this company was rigging up a machine for No. 6, NW cor. SE NE, same section. The Comar Oil Co. was building a rig for No. 11 Beverlin, CSL SE NW, Section 34-25-1w. Same company was building two additional rigs on the Endicott farm, No. 3-A, SW cor. NW SE, Section 34-25-1w, and No. 8-A, NE cor. NE SE, same section. McCaskey & Wentz have five new operations in the southwest quarter of Section 34-25-1w. Locations have been staked for Nos. 20 and 21; a rig is on the ground for No. 22, and rigs are being built for Nos. 23 and 24.

The Pennok Oil Co. has a rig on the ground for No. 8 Endicott, NW cor. SE SE, Section 34-25-1w. The Comar Oil Co. was building rigs for Nos. 5, 6, 7, 8 and 9, southwest quarter of Section 35-25-1w. The same company was building rigs for Nos. 7 and 8 Williamson, southeast quarter of Section 35-25-1w. T. B. Slick and others had a rig up for No. 6-A Endicott, CNL NE SW SW, Section 35-25-1w. The same operators had a rig on the ground for No. 7-B, SW cor. SE SW, same section.

Rigs are up for the Comar Oil Co.'s Nos. 5, 6 and 7 Ellsworth, northeast quarter of Section 2-24-1w, and No. 1 Blubaugh, NW cor. NW SE, Section 2-24-1w. The same company was rigging up tools at No. 9-A Carmichael, CNL NW NE, Section 3-24-1w, and was moving in tools at No. 12, NE cor. NW NE, same section, and building a rig for No. 13, CSL SE NE, same section. The Blackwell Oil & Gas Co. was building a rig at No. 8-A Ruzek, CNL NE NW, Section 3-24-1w. The Comar Oil Co. was building rigs at Nos. 7 and 8, NE SE, Section 3-24-1w.

Tulsa County Completions

In Tulsa County, Pennington and others have shut in a 5,000,000-foot gasser in sand at 1,327-35 feet at No. 1, CWL NW NW NW, Section 27-19-14. Obins & Weber's No. 1 Edwards, NW cor. SE SW, Section 1-18-12, was good for 400 bbls., 22 per cent basic sediment and water, in sand at 2,244-55 feet. West and others' No. 5 Smith, CEL NE NE, Section 11-18-12, was good for 150 bbls. in sand at 2,079-81. The Flesher Petroleum Co.'s No. 14, C SE NW SE, Section 12-18-12, made 50 bbls. from Wilcox sand at 2,015-52 feet. Posey, Short and others have shut in 200,000 feet of gas after a 60-quart shot in sand at 690-719 feet in No. 3, NW cor. NE NW, Section 24-28-12. The Scotland Oil Co.'s No. 5, CSL NW SE, Section 2-17-12, was dry and abandoned at 2,330 feet.

Grant and others were drilling at 140 feet in No. 1, SE cor. SE SW, Section 35-19-13.

In Hughes County

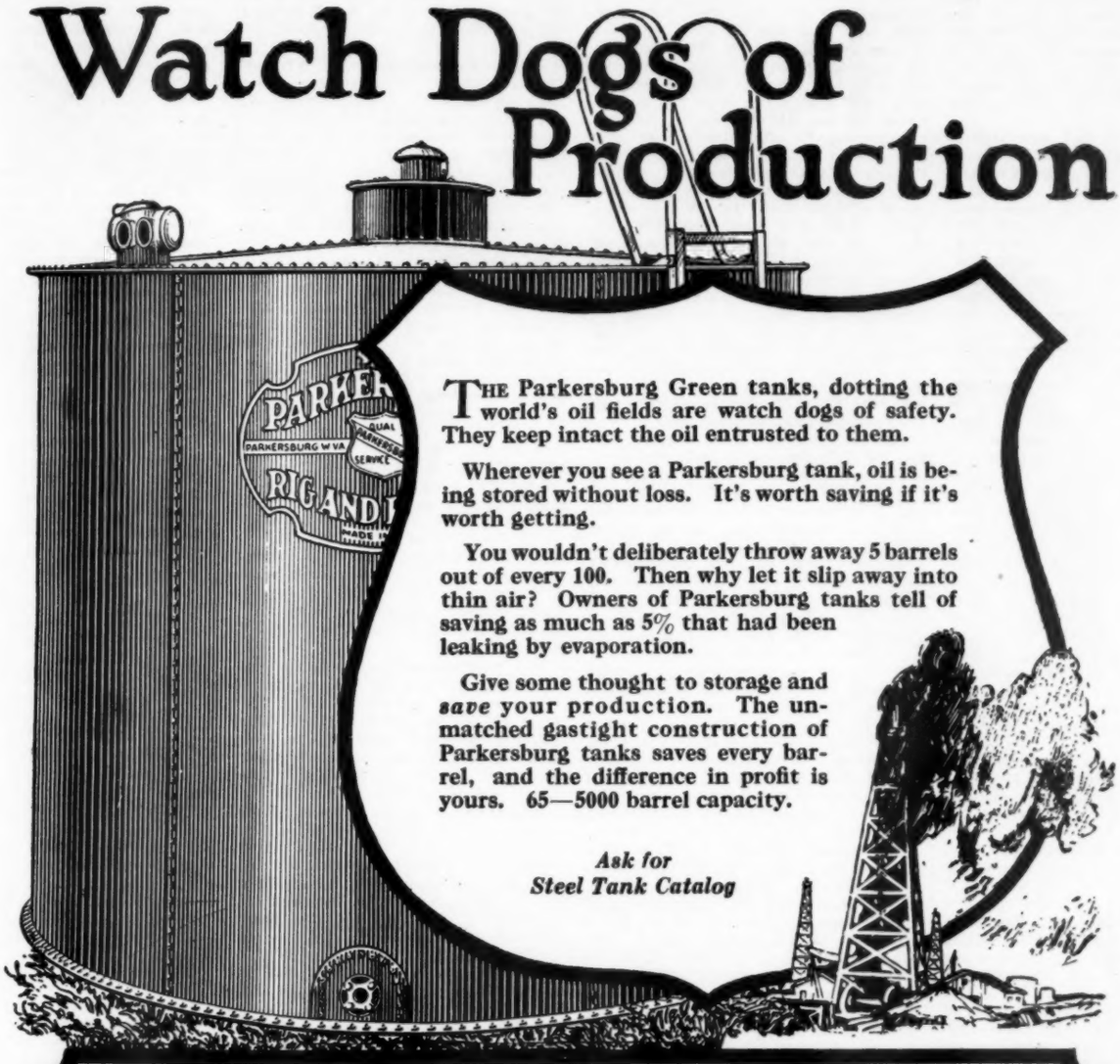
The Carter Oil Co.'s No. 1 Hully SW cor. SE NE, Section 5-9-10, made 331 bbls. the first 24 hours and 408 bbls. the second 24 hours in sand at 3,262-81 feet.

In Hughes County, the Prairie Oil & Gas Co. has located No. 2 Hully, C NE, SE NW, Section 5-9-10, and No. 3-A Lackey, C SE SE SE, same section. The Shaffer Oil & Refining Co. had a rig on the ground for No. 1 Buck, SE cor. NE SE, Section 20-9-10. The Mid-Kansas Oil & Gas Co. was bradenheading an 8,000,000-foot flow of gas in No. 1, NW cor. NE NE, Section 9-9-11.

Osage Completions

In Osage County, the Lewis Oil Co.'s No. 3, CEL NE SW SW, Section 36-22-11, was good for 75 bbls. after a 30-quart shot in pay at 2,280-83 feet. The Barnsdall Oil Co.'s No. 3, CEL SE NE, Section 10-21-9, made a 60-bbl. well after a 90-quart shot in pay sand at 2,242-77 feet. The Twin States Oil Co. had 1,000 feet of oil in the hole in sand at 2,920-65

Watch Dogs of Production



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feet at No. 7, SW cor. SW NW, Section 36-27-5.

J. A. Presbury and others were moving in tools for No. 1, NE cor. NE NW, Section 35-24-8. The Midland Oil Co. was building a rig at No. 3, CSL SW NE, Section 17-24-9. The Kansoma Oil & Gas Co. and others had a rig for No. 2, NW cor. NW SW, Section 21-24-9. The Waite Phillips Co. had a rig on the ground at No. 1, CEL NE, Section 21-24-10. The same company had staked a location for No. 1, SW cor. Section 12-23-8. The Twin States Oil Co. had a rig for No. 3, CWL SW NE, Section 13-23-8.

The Carter Oil Co. had completed a cellar for No. 12, C SE NW SW, Section 9-26-6, and No. 16, NW. cor. NW SE, same section. The Phillips Petroleum Co. and the Skelly Oil Co. were building a rig at No. 2, CSL SE SW SE, Section 23-27-5. The Tidal-Osage Oil Co. was fighting a bridge in No. 23, CNL NW SE NW, Section 34-22-10, after shooting sands at 1,860-78 and 1,878-1,920 feet with 250 quarts. The Superior Oil Corporation had a rig on the ground at No. 5, CEL W half E half SE, Section 5-22-11. The Ohio-Osage Oil Co. and others had a machine up at No. 2, SW cor. SW NW, Section 11-21-9.

In the northwest extension of the Burbank Field, the Phillips Petroleum Co. and the Skelly Oil Co. were digging cellars for Nos. 6, 7, 8 and 10, in the southeast quarter of Section 23-27-5. Same companies have staked locations for Nos. 12, 13, 14 and 15, S half NE, Section 25-27-5, and locations for Nos. 12, 13 and 14, in the northwest quarter of the same section, and Nos. 14 and 15, in the southeast quarter of same setion. Same companies had a rig on the ground for No. 6, CWL SW SW SE, Section 26-27-5, and were digging cellars for Nos. 7 and 8. The Phillips Petroleum Co. has staked locations for Nos. 5, 6 and 7, in the northeast quarter of Section 35-27-5. The same company has made a location for No. 1, SE cor. Section 10-27-5, and has rigs on the ground for Nos. 1 and 2, S half SE, Section 9-27-5. The Humphreys Petroleum Co. is drilling deeper at No. 4, CEL SW, Section 16-23-11.

New Work in Creek County

Much new work is evident in Creek County. The Jomac Oil Co. was building a rig for No. 1 Childers, NE cor. SW SE, Section 9-16-6, and has a rig up for No. 1, NW cor. NE SW, Section 17-16-9. The Carter Oil Co. had a rig up at No. 7 Durant, SE cor. SW NE, Section 18-16-9. The Wilcox Oil & Gas Co. had a rig on the ground for No. 4 Hamilton, SE cor. SE NE, Section 32-16-9. The Texas Co. was building a rig for No. 4 Newman, C NW SE NE, Section 35-16-9. The White Oil Corporation had rigs on the ground for No. 7, C NE NW NE, Section 35-16-9, and No. 8, C NW NE NE, same section. W. E. Brown was rigging up at No. 1 Horner, C NW SE SE, Section 35-16-9.

The Roland Oil Co. had a rig on the ground for No. 1 Homer, NE cor. NW NE, Section 2-15-9, and the W. E. Brown Oil Co. had a rig on the ground for No. 1 Bigpond, NW cor. Section 1-15-9 The Wilcox Oil & Gas Co. had a rig up for No. 1 Ansiel, SE cor. Section 32-15-10, and the same company was building a rig for No. 3 Post, SW cor. Section 33-15-10.

The Elro Oil & Gas Co. was building a rig for No. 1 Larney, NW cor. NE NE, Section 30-17-9. The Galvez Oil Co. was rigging up for No. 1 Mosquito, NE cor. NW NW, Section 30-17-9. Emery & Sons had a rig on the ground for No. 3 Jacobs, NW cor. NW NE, Section 21-16-9. The Nowata Oil & Refining Co. was building a rig for No. 1 Hendrickson, NE cor. NE NW, Section 21-16-9. The Transcontinental Oil Co. had a rig on the ground for No. 8 Looney, C SE SW NW, Section 26-16-9, and for No. 3 Ellis, NE cor. SE SE, Section 33-16-9. The Roland Oil Co. had a rig on the ground for No. 3 Lyons, NE cor. NE NW, Section 35-16-9. The Phillips Petroleum Co. was rigging up at No. 1 Smith, NE cor. NE SW, Section 35-16-9. The same company has staked a location for No. 1 Fife, SW NE SW, Section 8-15-9. Wilcox & Oswalt made a location for No. 1 Clinton, NW cor. SW SW, Section 12-15-9. The Waite Phillips Co. had a rig on the ground for No. 2 Grayson, NE cor. SE NE, Section 13-15-9.

Creek County Completions

The Prairie Oil & Gas Co.'s No. 5 Roberts, NW cor. SW SW, Section 8-16-9, was good for 35 bbls. naturally in sand at 2,642-78 feet. The Tidal Oil Co. has abandoned No. 1 Roberts, SW cor. SW NW, Section 15-16-9, at 480 feet. The Glasco Oil Co.'s No. 2 Williams, NE cor. SW SE, Section 16-16-9, was making 75 bbls. after a 100-quart shot in sand at 2,559-93 feet. The Waite Phillips Co.'s No. 1 Walker, SE cor. SE SW, Section 20-16-9, was dry and abandoned at 3,490 feet. The Wilcox Oil & Gas Co.'s No. 1 Barnett, C SE NW SW, Section 25-16-9, was dry and abandoned at 3,062 feet. The Jomac Oil Co.'s No. 6-A Carr, SE cor. SE NE, was good for 300 bbls. the first 24 hours in sand at 2,980-95 feet. The Phillips Petroleum Co.'s No. 5, NE cor. NE SW, Section 4-15-9, made 800 bbls. natural flow the first 24 hours in sand at 2,982-98 feet. The Wilcox Oil & Gas Co.'s No. 1 James, SW cor. NE SW, Section 33-15-9, was dry and abandoned at 3,837 feet.

The Link Oil Co.'s No. 1 Stepney, NE cor. NE NW, Section 35-14-7, was abandoned at 1,758 feet. The Independent Oil & Gas Co.'s No. 2 Beaver, SE cor. NE NE, Section 35-14-8, was good for 40 bbls. after an 80-quart shot in sand at 2,447-65 feet. The Carter Oil Co.'s No. 8 Grayson, SW cor. SW NE, Section 4-15-10, made 40 bbls. after two shots of 10 and 20 quarts in sand at 2,635-42 feet. The Wilcox Oil & Gas Co.'s No. 1 Brown, CSL NE, Section 5-14-9, was dry and abandoned at 3,895 feet.

New work in Creek County included Williams and others' No. 1-A Pepper, NE cor. SE NE, Section 9-16-10, rigging up. The Carter Oil Co. was fighting water after a 40-quart shot in sand at 3,365-74 feet, in No. 6 Cat, NW cor. Section 2-15-8. The Roland Oil Co. had two rigs up in the southwest quarter of Section 2-15-8, and the White Oil Co. had a rig at No. 3 Bear, SW cor. NW SE, same section. Brown & Kline were cleaning out at 1,225 feet in No. 1 Warnakee, SW cor. NE SE, Section 15-15-8. The Bradstreet Oil Co. was swabbing 30 bbls. in sand at 3,252-65 feet at No. 1 Bearhead, SE cor. Section 10-14-8. The Sinclair Oil & Gas Co. had a rig on the ground at No. 1 McGilvray, SW cor. NE NE, Section 30-14-8, and the Waite Phillips Co. had a rig on the ground at No. 1 Coker, SE cor. SE NW, same section.

Okmulgee Completions

In Okmulgee County, The Texas Co. finished No. 7 Grayson, CWL NW SE, Section 35-16-11, as a 7-bbl. well after a 60-quart shot in sand at 1,792-1,807 feet. The Oklahoma Natural Gas Co.'s No. 1 John Stanley, NW cor. Section 25-16-12, was dry and abandoned at 2,530 feet. The Interstate Oil Co. has shut in a 4,000,000-foot gasser in sand from 1,715-22 feet at No. 1 Williams, SW cor. SE SW, Section 16-16-14.

King and others had a 50-bbl. show in sand at 2,492-97 feet at No. 1-A Charles, NW cor. SW SW, Section 28-13-11. The Denver Producing & Refining Co. was drilling ahead after a 250-bbl. show in sand at 2,571-73 feet in No. 2 Holahta, CWL NE NE, Section 31-13-11. The Roxaline Oil Co.'s No. 3 Campbell, SE cor. NW SE, Section 24-13-12, was dry and abandoned at 1,955 feet. W. B. Pine's No. 3 Barnett, CNL NE NW, Section 3-11-12, was good for 2,500,000 feet of gas in sand at 2,640-42 feet.

The Rockwell Oil Co.'s No. 1-A Grayson, SW cor. NW SW, Section 1-15-11, was dry and abandoned at 2,840 feet. J. D. Ward and others have a dry hole at 3,040 feet in No. 2 Heckman, SW cor. Section 7-14-12. The Mitchell Oil Co.'s No. 7 Randell, CEL NW SW NE, Section 30-12-12, made 325 bbls. the first 24 hours and later settled to 175 bbls. in sand at 2,386-2,401 feet.

In Okmulgee County, the Kingwood Oil Co. had a rig up for No. 3 Stephens, CNL NW SW, Section 28-13-13. Sheldon and others were drilling at 350 feet in No. 2 Adams, C NE SW, Section 24-16-11. Kistler and others were moving in tools at No. 2 Berthoff, SW cor. SW NW Section 8-16-13.

O. F. Dickerson was building a rig at No. 1 Roberts, SW cor. NW SW, Section 28-13-11. The Denver Producing & Refining Co. had a rig for No. 3 Holahta, NW cor. NE NE, Section 31-13-11.

Jackson & Wise have a rig on the ground for No. 2 Phillips, CNL NW SW, Section 1-15-11. Jennings and others had a rig up for No. 1 Hill, NW cor. SE NW, Section 23-15-11. The Oklahoma Eastern Oil Co. had a rig up for No. 1 Harjo, SE cor. SE NE, Section 33-15-12. E. J. Lambert had a rig up for No. 1 Smith, NE cor. NW NE, Section 4-14-12.

E. R. Black's No. 2 Harjo, SE cor. SE NW, Section 34-12-12, was dry and abandoned at 2,637 feet.

Okfuskee County

Scott and others' No. 2 Daniels, CNL NW SE, Section 4-12-11, which started at 500 bbls. in sand at 2,670-72 feet, had settled to 150 bbls. Wangerine and others have staked a location for No. 1-A Tarvin, NE cor. NE SE, Section 8-11-10. W. B. Pine was rigging up at an old well in No. 1 Myers, CWL SW NW, Section 3-11-11. Waite Phillips was rigging up at an old well in No. 6 Jefferson, CEL NW SE, Section 13-11-11. McMan Oil Co. had a rig on the ground for No. 3 Buckley, SE cor. SE SW, Section 12-12-11. Amerada Petroleum Corporation was building rig for No. 7 Harjo, NE cor. NE NW, Section 13-12-11. Cory & Campbell had a rig on the ground for No. 1 Hayner, SW cor. NE NE, Section 11-12-12. Fisher & Umburn were moving in a rig for No. 1 Cubbie, SE cor. NE NW, Section 29-10-11.

The Zock-Barnes Petroleum Co.'s No. 1 Buckley, SW cor. SE NW, Section 14-11-10, was dry and abandoned at 3,168 feet. The Sinclair Oil Co.'s No. 1 Foster, SW cor. SW NW, Section 1-10-9, was spraying 15 to 20 bbls. of oil with 5,000,000 feet of gas from sand at 3,030-36 feet. Kemp and others have an 8,000,000-foot gasser at No. 1 Mullie, SE cor. SE NE, Section 2-10-9, sand at 3,031-44 feet. The Independent Oil & Gas Co. has abandoned No. 2 Field, NE cor. SE NW, Section 24-11-11, after losing the tools in the hole at 2,985 feet. The Minnehoma Oil Co.'s No. 1, NW cor. NE SW, Section 16-10-11, was swabbing 75 bbls. from sand at 2,964-66 feet. The Independent Oil & Gas Co.'s No. 4 Pigeon, CSL SW SW, Section 2-10-9, was dry and abandoned at 3,379 feet.

Muskogee-Wagoner

The Globe Oil Co. completed No. 3-A Colbert, SW cor. SE NE, Section 4-16-15, Wagoner County, as a 35-bbl. well after a 12-quart shot in sand at 1,072-1,100 feet. Hutchinson and others' No. 2 Colbert, CEL NE SW, Section 4-16-15, made 60 bbls. of oil after a 40-quart shot in sand at 1,058-1,075 feet. Fred Hyer and others' No. 2 Richards, CSL NE NE SE, Section 4-16-15, was good for 80 bbls. after a 60-quart shot in sand at 1,103-1,117 feet.

The Globe Oil Co. was moving in tools for No. 4 Colbert, CSL SE NE, Section 4-16-15. Fred Hyer and others have staked a location for No. 3 Richards, SE cor. NE SE, Section 4-16-15. The Savoy Oil Co. was fishing for a bit at 600 feet in No. 4 Colbert, NE cor. SE NW, Section 4-16-15. Same company and others have rigged up a machine for No. 5 Colbert, SE cor. SW NE, same section. Barney Flynn was drilling at 450 feet in No. 1 Smith, SE cor. NE NE, Section 14-16-15.

Garvin County

In Garvin County, the Magnolia Petroleum Co. abandoned the location for No. 2 Gibson, C SE SW SE, Section 10-1n-3w. The Texas-Pacific Coal & Oil Co.'s No. 4 Newberry, CSL NE NW SW, Section 13-1n-3w, was dry and abandoned at 1,932 feet. The same company's No. 5 Newberry, CSL SW NE SW, same section, was good for 16,000,000 feet of gas after a 10-quart shot in sand at 1,325-33 feet.

Carter County

Amerada Petroleum Corporation's No. 1 Baptiste, CEL SW SE SW, Section 20-5s-1e, Carter County, was dry and abandoned at 2,569 feet. The Iowa Oil & Refining Co.'s No. 1 Baptiste, NW cor. SE NE, Section 29-5s-1e, was dry and abandoned at 2,410 feet.

The Carter Oil Co. had rigs on the ground for No. 9 Woodruff, C NE SW NW, Section 15-4s-2w, Carter County, and No. 32 Woodruff, C NW SW NW, same section. The Skelly Oil Co. was drilling at 1,937 feet in No. 2 Gasaway, an old well, C SW NE NW, Section 16-4s-2w. The Carter Oil Co.'s new work in Section 21-4s-2w follows: No. 35 Noble, CEL SW NE NE, building rig; No. 36, C NE SE NE, rig up, and No. 37, CWL NW SE NE, rig on ground. The Skelly Oil Co. was drilling deeper in two old wells: No. 2 Dillard, CEL SE NE, Section 22-4s-2w, at 1,925 feet, and the same company's No. 3 Dillard, NE cor. SE NE, same section, at 2,002 feet. The Wolverine Oil Co. was also working over two old wells: No. 32 Dillard, CSL SW NE SE, Section 22-4s-2w, drilling at 1,872 feet, and No. 50, CSL NW NE SE, same section, cleaning out at 1,825 feet. The Carter Oil Co. has a rig on the ground for No. 8 Hefner, NW cor. SW NW, Section 23-4s-2w.

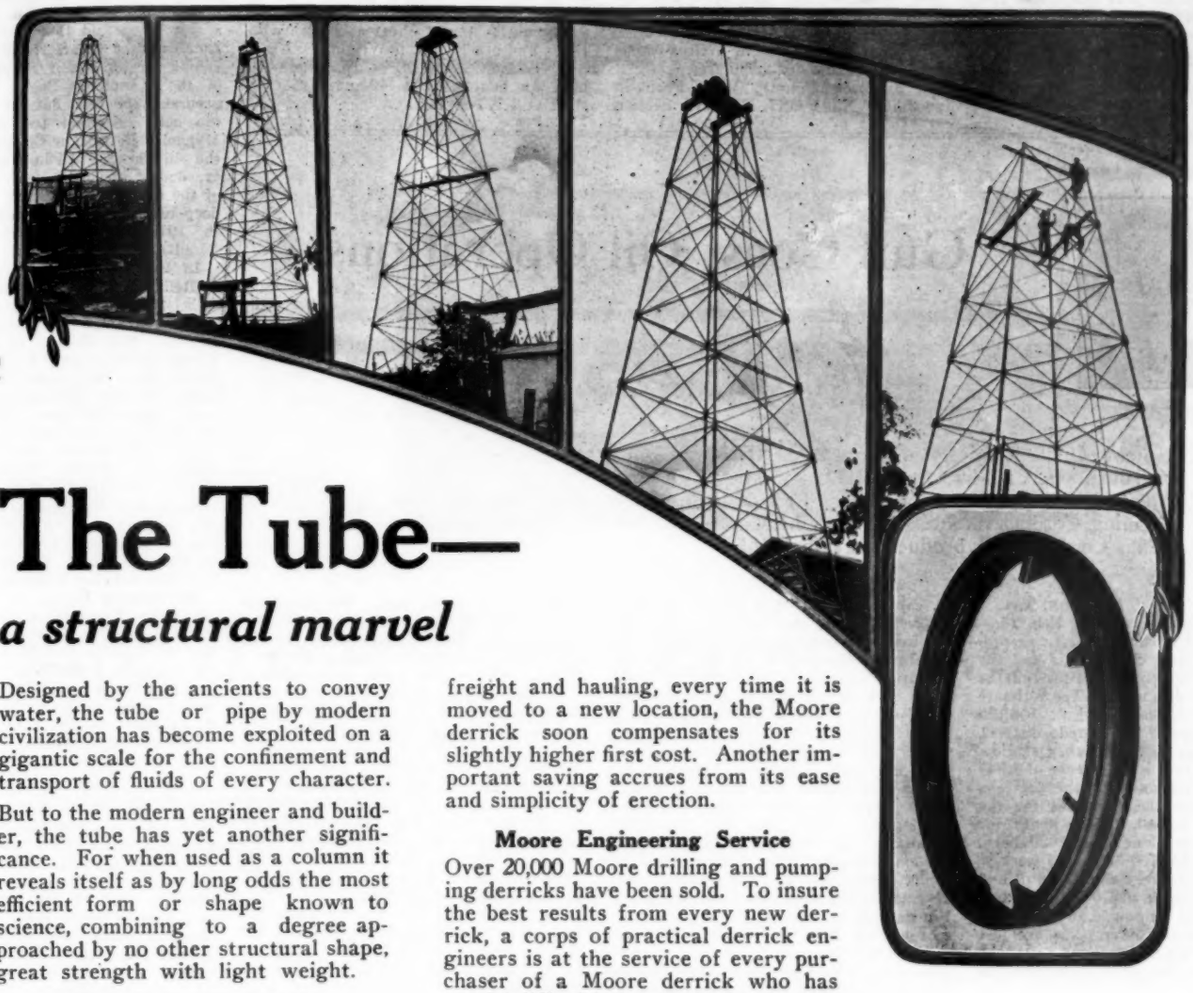
The Texas-Pacific Coal & Oil Co. had a rotary rig for No. 5 Pernell, NW cor. SW SE, Section 9-1n-3w . The Magnolia Petroleum Co. was building a rotary rig for No. 1 Gibson, C SE SE SW, Section 10-1n-3w. The Texas-Pacific Coal & Oil Co. had a rotary rig up at No. 1 Eddings, SW cor. NW SW, Section 10-1n-3w. The Magnolia Petroleum Co. had a rig up for No. 10-B Mauldin, C NE NW NE, Section 15-1n-3w. The Amerada Petroleum Corporation was drilling ahead after getting water at 395-405 feet in No. 7 Baptiste, SE cor. SW NE, Section 20-5s-1e. The same company was building a rig for No. 8 Baptiste, CWL NW SW NE, same section.

Stephens County Completions

In Stephens County, the Mission Oil Co. completed No. 1 Quinn, SW cor. SW SE, Section 23-1s-5w, as a 5-bbl. well in sand at 415-55 feet. The same company's No. 2 Quinn, SE cor. SW SE, same section, was abandoned at 750 feet. The same company's No. 3 Quinn, NW cor. SW SE, same section, was completed for 5 bbls. in broken sands at 632-715 feet. Other small wells were: Mudge Oil Co.'s No. 9 Wood, CSL SW NW, 23-1s-5w, 8 bbls. from sand at 716-36 feet; Prairie Oil & Gas Co.'s No. 3-A Landren, NE cor. SW NE, Section 34-1s-5w, 8 bbls. from sand at 668-690 feet; Skelly Oil Co.'s No. 11 McClanahan, NW cor. NE SW, Section 35-1s-5w, 30 bbls. from sand at 918-47 feet; same company's No. 2 Martin, CEL NE NW SW, Section 36-1s-5w, 5 bbls., sand 699-711 feet; same company's No. 3 Martin, CEL NE NW SW, same section, sands at 679-89 and 740-55 feet; Oakfield Drilling Co.'s No. 7 Cannady, CSL SW NE NW, Section 10-2s-5w, 10,000,000 feet of gas from broken sands at 584-827 feet.

The Roxana Petroleum Corporation shut in 3,000,000 feet of gas in sand at 1,102-10 feet at No. 1 Simpson, NW cor. NW NE, Section 11-1n-5w. The Amerada Petroleum Corporation shut in a 3,000,000-foot flow of gas in sand at 973-86 feet in No. 1, NW cor. SW NE, Section 12-1n-5w. Gant and others' No. 1 Delair, NW cor. Section 4-1s-8w, was good for 35 bbls. during the first 24 hours in sand at 1,842-57 feet.

The Arkansas Natural Gas Co. was moving in material for No. 1 Payne, SW cor. SW SE, Section 2-1n-5w. Cline & Brown had a rig at No. 1 Burns, NE cor. SE SE, Section 12-1n-5w. The Magnolia Petroleum Co. had moved timbers on the ground for No. 2 Wilson, CSL SW SE, Section 17-2s-7w. The Lone Star Gas Co. had timbers on the ground for No. 2 Andrea, C SW SE SW, Section 5-2s-6w. Champlin & Winkler had a rig up for No. 10 Rockwood, CNL SE SW, Section 20-1s-8w. The Magnolia Petroleum Co. had a rig up for No. 1 Bartley, C NE SW NE, Section 20-1s-8w.



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The Skelly Oil Co. was drilling at 770 feet in No. 12 McClanahan, NE cor. NW SW, Section 35-1s-5w.

In Creek County, Wilcox & Oswalt's No. 1, NE cor. NW NW, Section 30-16-10, was swabbing 40 bbls. in sand at 3,052-58 feet.

In Osage County, the Riverland Oil Co. and the Amerada Petroleum Corporation's No. 3, CNL NE, Section 34-23-8, was good for 200 bbls. in Wilcox sands at 2,747-90 and 2,792-2,800 feet.

In Jefferson County, Wirt Franklin and others' No. 1 CNL NE NW, Section 25-4n-6w, was showing gas on top of sand at 1,773 feet.

Okmulgee County came back with Dunn and others' No. 6 Wright, CSL SE SW, Section 22-14-14, which made 40 bbls. an hour after a 40-quart shot in sand at 1,771-80 feet.

Gulf Coast Oil Operations

By P. L. McGREAL

Humble Oil & Refining Co. has a 25,000,000 cubic foot gas well flowing wild on south side of dome at Hull. On west side of the dome, this company's No. 3 Abel made 400 bbls. by heads first day and then stopped flowing. Gulf Refining Co. has 100-bbl. well in Vinton Pool, southern Louisiana and The Texas Co. a 175-bbl. producer in same pool.

HOUSTON, Tex., Feb. 26.

The estimated gross daily average production in the Gulf Coast pools and the Southwestern districts hovers around the 110,000-bbl. per day mark. The estimate for the past week is placed at 106,195 bbls., which includes the Laredo district, Somerset and the Milam County shallow sand sections. This is a decrease of 1,945 bbls. from the estimate for the previous week. Deducting the estimates for the three districts named, the estimate for the Coastal pools alone is 102,620 bbls., compared with 104,730 bbls. last week.

The changes are very slight. Hull and West Columbia pools are off a little and Goose Creek and Vinton show increases. The averages in the other pools are just about the same as last week.

The estimate for each district is as follows:

District—	Bbls.
Batson	850
Blue Ridge	730
Barber Hill	410
Dayton	60
Damon Mound	3,150
Edgedly (La.)	620
Goose Creek	19,700
Humble	6,600
Hull	19,950
Jennings	400
Markham	95
Orange	11,500
Pierce Junction	920
Spindletop	810
Sour Lake	4,975
Saratoga	1,740
Somerset and Piedras Pintas	3,290
Vinton	5,325
Welsh and Anse La Bute	95
West Columbia	21,400
Miscellaneous	3,675
Total	106,195

Continued strength in the light gravity crude markets lends hope to the Coastal producer that his product will be favored with another advance and old leases are being overhauled in anticipation of the time when credit balance quotations will justify the cost of reviving the old wells and putting them on jacks or the beam. Producing properties that had been on the market for sale have been withdrawn or a higher valuation placed upon them. Production in the Gulf Coast pools now ranges from $700 to $1,000 per barrel, depending upon location, amount of land under lease, life of the wells and other details. An option to buy one of the largest producing properties in Hull Pool expired February 1 and the property has been withdrawn and all negotiations are off. The sale price was around $1,000,000. The same is true of producing properties in the Orange and other pools.

Wildcatters Active

Eastern and northern wildcatters, who have been drilling on the prairies in the Coastal belt, are seeking prospects near some of the known salt domes, where considerable money has been expended in the past in an effort to define the extent of the salt mass and then work off it. However, land around these known domes is scarce as much of it is and has been under lease for years and such as is open for leasing commands a stiff bonus and usually an over-riding royalty. The big operating companies are carrying these leases and paying rentals and have been doing so for years in anticipation of the time when they will become producing areas. The average wildcatter, especially those not familiar with conditions in the Gulf Coast region, is averse to paying a heavy bonus for the privilege of doing development work and an over-riding royalty in addition, providing he gets a well. Hence, he takes a large block of rank wildcat acreage, where the chances of getting anything are practically nil. Big acreage appeals to the usual tenderfoot coming into this region. Whereas, the men familiar with the history of these domes and the conditions surrounding them will willingly pay a good bonus for 10 acres close around a dome where he knows much money has been spent in exploration work, than take 10,000 acres for the cost of a test in territory he knows nothing about. These are bald facts, based upon years of observation and watching the experiences of many wildcatters.

However, it should be understood that the above statements do not apply to the southwestern districts, but to the Gulf Coast belt alone. The territory extending from the Rio Grande north to the Somerset Field, in which much wildcat work is now under way and more scheduled, is an entirely different proposition. That region is structural and presents its own problems, which are geological and not within the province of ordinary oil writers to attempt to explain.

Conditions in the Coastal pools are far from normal, due to heavy rains and continued cold weather. The roads are bad and difficulty is experienced in handling material. Drilling operations are being delayed and consequently but few completions were recorded during the week.

Large Gas Well

In the Hull Pool, the Humble Oil & Refining Co. has a wild gas well in No. 17 Guedry, on the south side of the dome. It is estimated to be blowing at the rate of 25,000,000 cubic feet per day. The bottom of the hole is around 3,000 feet and it will be deepened when the pressure is exhausted. The same company's No. 9 Hooks-Spells, a workover, is making 75 bbls. at 3,050 feet. On the west side of the dome, its No. 3 Abel was good for 400 bbls. by heads at 920 feet for 24 hours and then quit flowing. No. 4 Abel is pumping 150 bbls. at 2,180 feet. No. 3 was drilled to 2,800 feet and tested without getting anything. It was then plugged back to the depth given. The same company is setting a liner in No. 1 Barrow at 3,350 feet. The Monarch Oil & Refining Co. worked over Nos. 1 and 2 Abel. The former is good for 150 bbls. and the latter is making 250 bbls. of fluid, 40 per cent water and sediment.

In the Goose Creek Pool, the Gulf Production Co.'s No. 28 Schilling is pumping 50 bbls. at 3,585 feet after being worked over and No. 1-A Hirsch is pumping 100 bbls. at 4,375 feet. The company is bailing No. 9 Smith at 2,600 feet. It, too, is a workover. At Damon Mound, the Sinclair Oil & Gas Co. is building a standard rig to put No. 15 Jackson on the beam at 2,910 feet. The oil stands 1,000 feet in the hole. It is bailing No. 17 Masterson at 1,675 feet.

At Barber Hill, the North Dayton Oil Co.'s No. 1 Richardson is flowing 150 bbls. by heads at 2,230 feet and the Humble Oil & Refining Co. is bailing No. 1 Blaffer & Farish at 3,150 feet after sidetracking. The Gulf Production Co.'s No. 9 Taylor is pumping 75 bbls. at Pierce Junction at 3,700 feet. It is an old hole worked over. At Big Creek, in Fort Bend County, a semi-pool, the Gulf Production Co. went into rock salt in No. 3 Davis at 675 feet and abandoned it. A location has been made for No. 4 about 1,000 feet north from No. 3. A location has also been made for No. 4 Wheat about 1,000 feet south from No. 3. Two nice wells were completed in the Vinton Pool in south Louisiana. The Gulf Refining Co. got a 100-bbl. well in No. 55 G. N. G. at 2,300 feet and the The Texas Co.'s No. 19 Gray is good for 175 bbls. at 2,475 feet. The same company is bailing No. 16 Vincent at 2,440 feet and the Gulf Refining Co. is bailing No. 1 Vincent at 2,450 feet. The Vinton Petroleum Co. is setting a liner in No. 37 Gray at 2,335 feet and the Tanner Oil Co. abandoned No. 1 Vincent at 4,150 feet.

Southwest Fields

Completions in the Laredo district include the Nueve-Cin-Tex Oil Co.'s No. 1, making 175 bbls. at 1,610 feet. It is in Survey 592. The Eubank-Kirkwood Oil Co.'s No. 3, Survey 2341, has increased to 800 bbls. at 1,580 feet.

In the Somerset light gravity field, the Empire Gas & Fuel Co. has 8-bbl. wells in Nos. 1 Sanfield, 3 Dowbroskie and 4 Carruthers. The Glasscock Leasing Co.'s No. 13 Klemcke is making 10 bbls. and the Grayburg Oil Co.'s No. 13 Muennick 5 bbls.

Two wildcat tests in the Coastal region are to be tested and are being watched by the scouts because of the possibilities of opening new territory. The Houston Oil Co. has 20 feet of strainer on the ground to set in No. 3 at Big Hill in Jefferson County at about 1,350 feet where the bit went into 16 feet of sand showing oil and gas. The other is the Monarch Oil & Refining Co.'s No. 1 Hautier, 12 miles east of Houston. This hole was drilled to around 3,400 feet and then plugged back to 2,140 feet for a test in a sand that showed gas. The Amalgamated Oil & Refining Co. is still fishing in its No. 1 Oswald, southwest of the Spindletop Pool. It showed oil around 2,200 feet, but the pipe stuck in the hole. Another test is that of the Magnolia Petroleum Co. on the Stiles in the old Thrall Field in Williamson County, drilled to 3,100 feet where 13 feet of the sand will be tested. It is the first deep test in that field, which was opened in 1915. The present production is found around 1,100 feet.

In Fort Bend County, the Neilan Oil & Refining Co. is still fishing in No. 2 Gobels, near Thompson, at 3,460 feet. The drill pipe stuck due to boiler trouble. The Booth Oil & Gas Co. is setting 8-inch casing in No. 1 Booth at 1,500 feet. The Iona Oil Co.'s No. 1 Bryan is below 2,000 feet and No. 1 Hellmuth below 350 feet. The Humphrey Oil Co.'s No. 1 at Neeville is below 1,800 feet. R. E. Brooks, Jr., No. 1 Ferris is drilling at 710 feet. In Galveston County, the Sun Oil Co.'s No. 1 Guedry at High Island is drilling at 2,490 feet with No. 5 Cade starting and a location for No. 6. The Yount-Lee Oil Co. has rigged up No. 1 Guedry. The Gulf Coast's No. 1 White is below 2,700 feet.

At Hockley Dome, in Harris County, the Texas Exploration Co. set casing at 2,000 feet in No. 10 Warren and is drilling No. 13 below 450 feet. The Pulaski Oil Co.'s No. 1 Singleton is around 2,800 feet and the Westmoreland Farms' (Inc.) No. 1, near Bellair, is below 1,875 feet. The Garrett Oil Co. is trying to shut off water in No. 2 Channel City at 3,475 feet. Other tests are idle.

Angelina County

H. C. Jennings, formerly of Bartlesville, Okla., is starting five tests in Angelina County, southwest of the old Nacogdoches Field. He recently drilled two wells there, getting a sand at the shallow depth of 550 feet. These wells are pumped once each day and make about 8 bbls. The refinery at Nacogdoches takes the oil, paying $2.50 per barrel. It is high in lubricating content. In addition to the operations by Jennings, Wheatley and other' No. 1 Renfro is at 365 feet and Young and others' No. 1 Arras is fishing at 720 feet. The Falvey-Wilson's No. 1 Connor is drilling at 354 feet. Baker & Hunt have a location for No. 1 Hunt. A comparison of the logs of wells in the old Nacogdoches Field and the new development in Angelina County shows a dip of 50 feet to the mile and it is believed Angelina County is in the path of deeper sands.

In the Markham district in Matagorda County, Derring and others' No. 1 Myers, on the north side of the dome, is setting 8¼-inch casing at 2,650 feet. The Amerada Petroleum Corporation is sidetracking at 2,275 feet in No. 1 Smith and the Monarch Syndicate's No. 1 Hautier is shut down at 4,100 feet. The Commonwealth Oil Co. has a derrick up for No. 3 Hawkins. In Brazoria County, Faust and others' No. 2 is idle at 4,150 feet. It is about 3½ miles northeast of the West Columbia Pool. West of the pool, Sacks and others' No. 1 Hogg is below 3,350 feet. Near Angleton, the Stranger Mound Oil Co.'s No. 1 is drilling at 1,235 feet. The Transcontinental Oil Co.'s No. 2 Breen at Old Ocean is drilling at 876 feet. Others tests are idle.

The Long-Green Oil Co. is setting 6-inch casing in No. 1 Jones, 12 miles northeast of Huntsville, Walker County, at 2,300 feet. It shows some gas. The Walker-Maderson Co.'s No. 2 is below 2,910 feet and Shackleford and others' No. 1 is at 2,700 feet. In Caldwell County, where two light gravity wells have been developed at 2,100 and 2,150 feet, the United North and South Oil Co. is drilling No. 1 Sullivan at 3,546 feet. A derrick up for No. 2 Rois. The Prairie Lea Production Co.'s No. 2 Merriweather is at 2,000 feet and No. 1 Kean at 450 feet with locations for Nos. 2 McKean and 1 Tiller. Hitchcock, Cooper & Feltner's No. 1 Smith is below 1,900 feet. The Luling Oil & Gas Co. is start-

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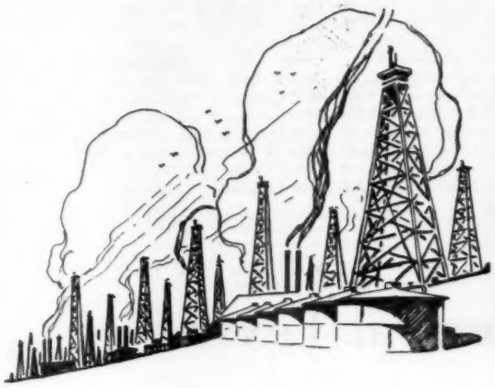

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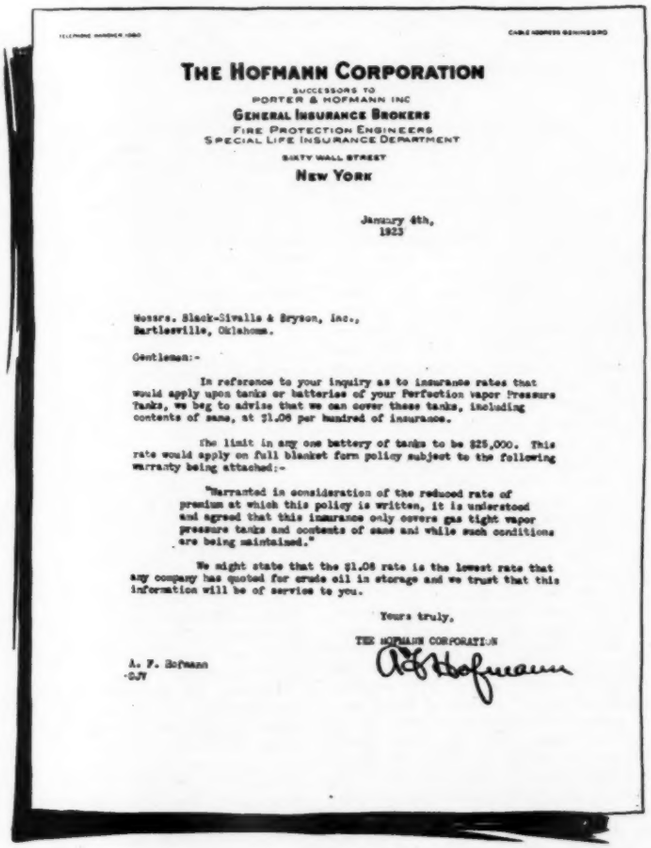

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ing No. 1 Polk, 4 miles north of the producers, and the Luling Production Co. has a location 3 miles north. The Caldwell County Oil Co.'s No. 1 Hartman is below 655 feet. Locations have been made for Anderson and others' No. 1 Robinett, Booth and others' No. 1 McNeil and Lebow and others' No. 1 Merriweather. Raynor and others' No. 1 Walker is drilling around 1,600 feet.

In Gonzales County, the J. K. Hughes Development Co.'s No. 1 Stevens is at 2,450 feet. In Live Oak County, The Texas Co. is rigged for No. 1 Ward ranch. The same company has started No. 1 Theilman, southwest of Brenham, in Washington County. In the Big Bend district in Brewster County, the Portland Syndicate's No. 1 is below 2,400 feet, with tests by the Marathon Oil Co. Twin City Oil Co. and Brewster County Oil Co. standing idle. In Pecos County, Troy and others' No. 1 Johnson is shut down. The Pecos Valley Oil Co. has a rig for No. 1 Fuller. The Oregon-Texas Oil Co. is going to deepen No. 1 Turney from 2,200 feet and the Southern States Development Co.'s No. 1 Odem is drilling around 615 feet.

In the Orange Pool, the Sun Oil Co. worked over No. 1 Brown on the east side of Cow Bayou at 3,500 feet and it is pumping 35 bbls. The Gulf Production Co. is putting No. 6 Chesson on the beam at 3,375 feet. The Sun Oil Co. is starting No. 1 Kato, three-quarters of a mile east of production. The Sinclair Oil & Gas Co.'s No. 5 Granger is drilling around 2,700 feet. The Supreme Oil Co. has made locations for Nos. 3 and 4 Jackson. The Orange Petroleum Co. has started No. 3 Berwick. On the northwest side, the Kishi Development Co. is running tubing in No. 20-E Kishi at 4,100 feet. Ten-inch casing has been set at 1,100 feet in No. 2 Bland and No. 3 is rigging. Its No. 1 Smith-Foreman is drilling around 1,980 feet. The Gulf Production Co.'s No. 4-A Kishi-Lang is below 1,415 feet and No. 7 is around 1,345 feet. The Humble Oil & Refining Co. is rigging Nos. 2 Kishi-Lang, 2 Bland and 15 Kishi. The Hamilton Oil Co. is starting No. 12 Chesson, on the west side of the pool, as an offset to the Gulf Production Co.'s No. 1 Watson. The Edgerly Petroleum Co. is working over No. 5 Carbello. The Brownie Babbittee Oil Co. is deepening No. 2 McLean, as is the Amerada Petroleum Corporation's Nos. 2 and 3 on the banks of Cow Bayou.

At Spindletop, the Unity Oil Co. is drilling No. 81 McFaddin, and Wilson & Broach, No. 3 Fort Worth. In the Batson Pool, the Kirby Petroleum Co. is fishing in No. 1 Hodges and working over No. 7 Christian. The Sun Oil Co.'s No. 1 Sessler in the Saratoga Pool is below 1,110 feet. In the Sour Lake Pool, The Texas Co. is working over No. 225 fee at 1,255 feet. Gulf Production Co.'s No. 53 Hardin is around 1,235 feet and No. 54 is below 1,200 feet with No. 55 starting. The Lake View Oil Co.'s No. 30 Morrison is below 1,900 feet with No. 1 Minor rigging. The Mystery Oil Co.'s No. 1 Minor is drilling at 1,235 feet. The Minor lease is about 500 feet in advance of production.

At Pierce Junction, Masterson Smith's No. 1 Camp, on the south side of the dome, is drilling at 365 feet. On the east side, the Gulf Co., Humble Oil & Refining Co. and Snowden & McSweeney are working over old wells. The Sun Oil Co. is deepening No. 1 Whitehead, on the north side, at 3,300 feet. At Blue Ridge, The Texas Co.'s No. 10 Robinson, on the north side of the salt mass, is drilling at 900 feet. On the east side, the Gulf Co.'s No. 6 Blakely is below 2,700 feet and its No. 6 Luscher is rigged. At Damon Mound, the Sinclair Oil & Gas Co. is rigging Nos. 29 Bryan, 3 Mock, 16, 17 and 18 Jackson and 1 Proctor. The Southern Petroleum Co. is ready to spud in No. 2 Norton. The Hyde Production Co. will test a showing in No. 2 Kittrell at 3,185 feet.

At West Columbia, The Texas Co.'s No. 15 Hogg, a worked over hole, is showing oil and gas at 2,915 feet. The Humble Oil & Refining Co. set casing in cement in No. 1 Wilson-Melgard at 3,375 feet and shut down for it to harden. The same company is working over Nos. 12, 21 Japhet, 3 Bashara and 3 Coon. The Gulf Coast Co.'s No. 9 Eyres is drilling below 2,500 feet and No. 4 McMeans is working over. The Crown Oil & Refining Co. is deepening No. 3 Marmion at 3,900 feet and the Wichita Petroleum Co. is testing No. 2 Smith at 3,440 feet. In the Humble Pool, The Texas Co. is working over Nos. 154, 199 and 211 on the Landslide and Nos. 10 and 19 Wheeler-Pickens. The Southern Petroleum Co. is also working over an old well on the Landslide.

On the west side of the Hull Dome, the Gulf Production Co.'s No. 6 Hannah is deepening at 3,300 feet with a location for No. 11. The Republic Production Co. is deepening No. 3 Hannah. The Amerada Petroleum Corporation's No. 1 Hannah is below 2,780 feet. The Humble Oil & Refining Co.'s No. 1 Taylor is below 2,709 feet and No. 1 Bailey at 2,345 feet. The Monarch Oil & Refining Co. is rigging Nos. 5 and 6 Abel. The Mecom Oil Co.'s No. 2 is drilling at 2,010 feet. A derrick is up for No. 3 Cantor by Bissonett & Giescke. On the north side, the Yount-Lee Oil Co.'s No. 6 Merchant is drilling at 2,745 feet with No. 7 rigged. No. 3 Stengler is below 3,100 feet. The Higgins Oil & Fuel Co.'s No. 7 Merchant is at 1,875 fet. The Gulf Production Co. has rigged No. 12 Morris-Phillips.

On the east side, the Republic Production Co.'s No. 15 Dolbear is working over. A derrick is standing for No. 56 and No. 57 is drilling below 2,300 feet. To the southeast, the Gulf Production Co.'s No. 34 Phoenix is drilling at 2,735 feet. The Champion Oil Co. has a rig for No. 2-A Phoenix. On the south side, the Sun Oil Co. is working over No. 2 Carr and the Houston Production Co.'s No. 3 Cantor. The Empire Gas & Fuel Co.'s No. 15 Barngrover is drilling around 3,910 feet.

At Goose Creek, old wells are being worked over on the Galliard, Smith, Schilling and Sweet leases by the Humble Oil & Refining Co. The Gulf Production Co.'s No. 27 Beaumont Petroleum Co. is below 3,400 feet and No. 23 is a workover. No. 5 Chapman-Bryan is below 3,910 feet. The Sun Oil Co., Turnbow Oil Co. and Copeland Oil Co. are also working over old holes. The latter is on Spillman Island. Newton & Gilcrest's No. 3 Wright is below 2,435 feet. The Gulf Coast and Crown's joint No. 36 Gilliard is below 1,980 feet.

North-Central Texas Field

By DAN F. DUGAN

Texhoma Oil & Refining Co.'s No. 2 Hirschi in Hirschi Pool, Wichita County, good for 300 bbls. Comet Petroleum Co.'s No. 2 Ferguson in Archer County, flowed 400 bbls. first day at 1,860 feet. Panhandle Refining Co.'s No. 1 Fox, 4½ miles southeast of Eastland, looks good for between 200 and 300 bbls. Gordon Petroleum Co.'s No. 4 Caudle, Eastland County, flowing 250 bbls.

FORT WORTH, Tex., Feb. 26.

An increase in production of 3,390 bbls. daily, was reported for the North Central Texas Field for the past week. The newer pools made the largest gain, and about offset their loss of the previous week. Small gains were reported from all of the other pools with the exception of Stephens County which had a loss of 260 bbls. daily. The total production for the week was reported at 117,900 bbls. daily.

The Hirschi Pool furnished Wichita County's best near completion. The Texhoma Oil & Refining Co.'s No. 2 Hirschi is flowing from the 1,885 foot sand and is estimated good for 300 bbls. daily. The Pigg Oil Co.'s No. 6 Hirschi was placed on the pump and is good for 50 bbls. The same company's No. 8 on the same tract is bailing a sand at 1,875 feet. The Cooper & Green's No. 1 Dale to the west of the Hirschi is drilling towards the upper pay and is at 1,810 feet. On another section of the Dale lease, the Gulf Production Co.'s No. 2 has standardized on top of the sand at 1,810 feet. The Sun Oil Co. has timbers on the ground for the No. 4 Hirschi on the northwest corner of the Josie Mumford survey. Location has been made and a derrick is up for the Pigg Oil Co.'s No. 11 Hirschi located 225 feet north of the No. 10 Pigg.

What looks to be a good producer is nearing completion by Bridwell-Heydrick on the Waggoner lease. It is reported flowing 125 bbls. from the sand at 1,807 to 1,820 feet and is located in the extreme west section of the lease and practically proves up all parts of the acreage, being the nineteenth producer drilled on the lease. What looks like another good producer is the Associated Oil Co.'s No. 1 Grace Jennings, about 3 miles to the south and east of Electra. The top of a sand was encountered at 1,818 feet, and showed plenty of fluid. The hole, which has over 1,000 feet of mud, will be cleaned and the well bailed. This is the second test to pick up this sand in that territory, the other producer being the L. P. Hammond's No. 1 Jennings, completed a few weeks ago.

East of Electra, the Camp Oil & Gas Co. completed No. 4 Douglas for 150 bbls. from the sand at 1,940 to 1,960 feet. The Magnolia Petroleum Co. is drilling a semi-wildcat on the north part of the Sumner lease about 3 miles northeast of Electra and has plugged back to a sand at 1,056 from 1,079 feet. The well shows some oil and considerable water. It is being bailed. The Green and others' No. 1 Jennings, east of Electra, was reported on the sand and flowing at the rate of 400 bbls. a day. The sand was picked up at 1,820 feet. It is an offset to a dry hole drilled in 1916 to a depth of 2,000 feet.

The week's activity in Archer County shows several wells completed, many tests nearing completion and a great many new locations made. The best completion reported is the Texhoma Oil & Refining Co.'s No. 1 Cetti, located a mile southeast of the Freeman-Hampton Pool. This test is a semi-wildcat at 1,780 feet, it is showing 150 bbls. of oil and 200 bbls. of water. What looks to be the most promising near completion for the week is the Comet Petroleum Co.'s No. 2 Ferguson at 1,860 feet. During the first 24 hours it flowed 400 bbls. The same company's No. 3 is washing the hole on top of a sand at 1,760 feet.

A wildcat which had its share of interest for some time has been finally abandoned, it being the Knight & Hines' No. 1 Annie Jackson, about 7 miles north of Archer City, and a short distance east of the Texas Pacific Coal & Oil Co.'s tests drilled on the Luke Wilson ranch last summer. These tests had sufficient showing to encourage further drilling, though so far none of the wildcatters has been rewarded. The Knight & Hines' test was abandoned at 1,810 feet. The same operators are starting a new wildcat on the Coleman ranch north of Scotland. A rig probably will be moved on the location the first of the week, and drilling started immediately. Several dry holes, both shallow and deep, have been drilled on this property, though they were several miles apart.

The Freeman-Hampton Corporation has three tests due to be completed in a few days. Nos. 4 and 5-B Ferguson are on the sand at 1,580 feet. No. 10-A is right at pay sand. The White Oil Corporation completed its No. 3 Kemp-Kempner for 75 bbls. The same company is making preparations to drill No. 4 and is rigging up a rotary. The Gulf Production Co.'s No. 1 Riggs had the casing to part and has some water trouble. This well has all the appearance of making a good producer when the water trouble is overcome.

Stephens County

Oil activities in Stephens County are showing a decided increase since the first of the year. Several of the large companies are making preparations for extensive drilling campaigns with the coming of spring.

The Eliasville section of the county will have an increase in development due to a number of locations made, and it is expected that more than 30 tests will be drilling within the next 30 days. In the Brown-Douglas Field southwest of Eliasville, several new companies, among which is Snowden-McSweeney, and Payne & Parker are starting operations. The former will drill a test on the Brown farm, and the latter will drill a test on the Price tract.

Interest for the week is centered in the Silkwood Drilling Co.'s No. 1 Brown which is shut down on top of the pay at 3,000 feet, with a strong gas pressure and spraying considerable oil. This is an offset to the original Eliasville Pool Syndcate's No. 1 Douglas, and is the first well to be completed since the discovery well came in. The Gulf Production Co.'s No. 3 Kloh-Rumsey, 18 miles northwest of Breckenridge, is a completion for 700 bbls. at 3,220 feet. In the south field, the Prairie Oil & Gas Co. completed No. 12 Adkins with a daily production of 250 bbls. in the Caddo lime.

Eastland County.

With good weather prevailing there was a general renewal of field activities in Eastland County during the past week. A number of rigs are building and several new locations have been made. Several tests in territory surrounding the town of Eastland are making ready for completion. One of the most important and promising of these is the Panhandle

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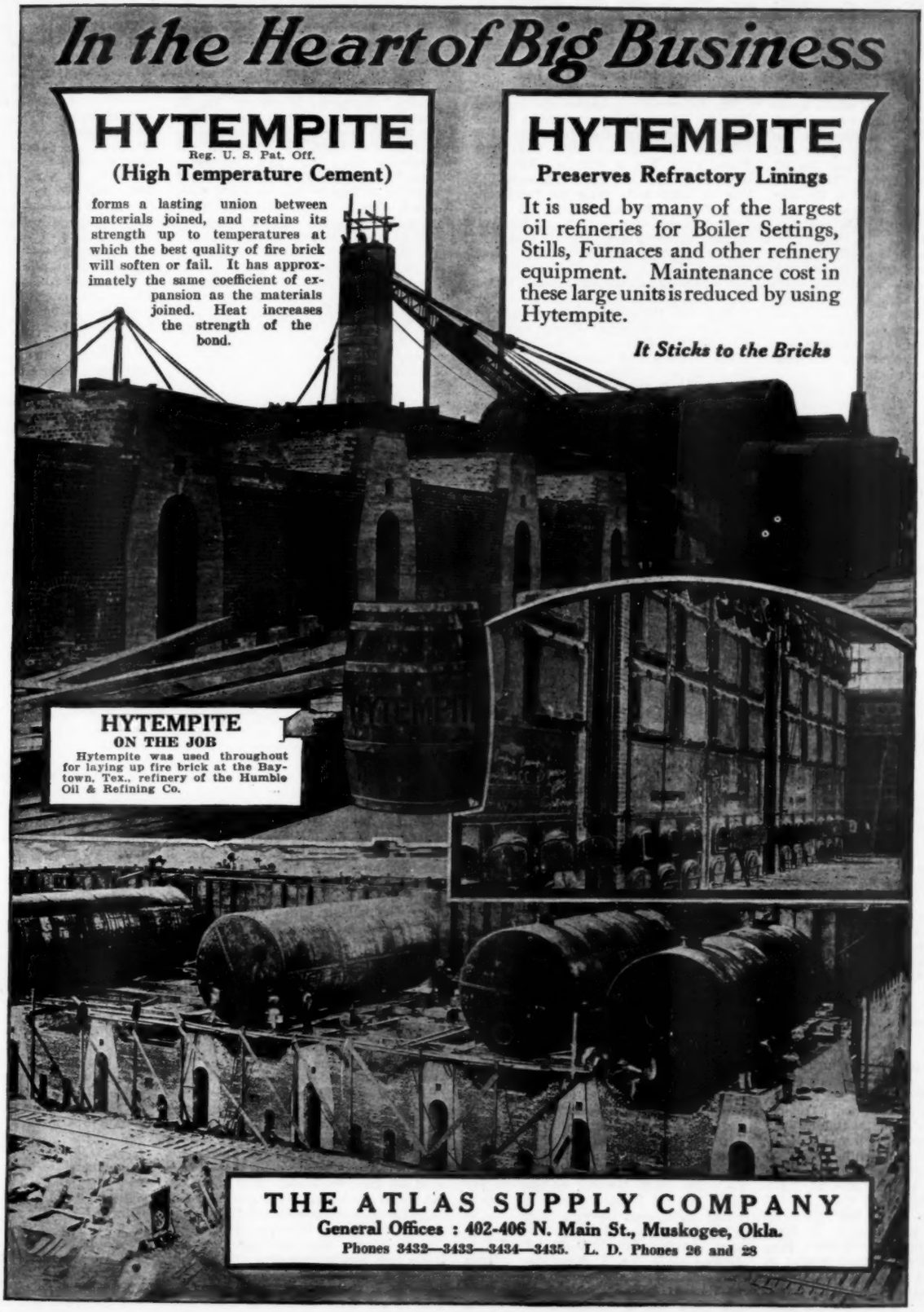

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Refining Co.'s No. 1 Fox, 4½ miles southeast of Eastland. The top of the sand was struck at 3,525 feet and the test began flowing by heads and is good for from 200 to 300 bbls. with a possibility of larger production when drilled deeper into the sand. This well is in semi-wildcat territory and means a great deal to the Eastland Field and it will open up a great deal of additional acreage to drilling.

The Fox well is about 1½ miles from a well on the Brasher farm, which was drilled in 1918, which came in a big gasser and later was a good oil producer. In the meantime the big gushers had come in farther north and the well was abandoned when its oil production began to decrease. The Root, Rhodes and Sykes' No. 2 Hill in the lake district just northwest of town is producing at the rate of 300 bbls. per day, from the lake sand at 3,204 feet.

Another Good Completion.

Another near completion attracting attention is the Gordon Petroleum Co.'s No. 4 Caudle. The sand was struck at 3,217 feet and it has been drilled a few feet in and is flowing by heads, with an estimated production of 250 bbls. and may exceed this amount when drilled deeper. It ran true to form with other wells drilled by the Gordon Petroleum Co. on this tract. The Associated Oil Co.'s No. 2 Downtain is also showing for a producer. It is in the Lake Eastland district and is showing for around 200 bbls. daily at 3,200 feet. North Brown County is getting into the limelight with the completion of the Crabb and others' No. 1 McDonough, 7 miles south of Cross Plains, and the near completion of the Gilman and others' No. 1 Newton. The discovery of the existence of the pay strata of the new field was made in May of last year by Gillet & Magnese in the No. 1 Prater which unexpectedly picked it up at 1,328 feet. The well put on the pump showed an initial production of 40 bbls. and is still reported to average 36 bbls. daily actual pipe line runs.

The Crabb and others' No. 1 McDonough reached the top of the pay at 1,315 feet or 13 feet higher than the Gillett & Magnese well. It was drilled five feet in the pay and is making regular flows of about 40 minutes duration every five or six hours through 6-inch casing. Its production is estimated from 100 to 200 bbls. The Gilman well is placed in the 100-bbl. class. The location of the three wells so far completed, with the uniformity of depth and structure, has proven a territory almost 4 miles east and west with no boundary defined except at the fartherest northeast point where the Junior Oil Co.'s well, a failure at this producing depth, seemed to indicate the structure might be pinching out. In Burkburnett the Magnolia Petroleum Co.'s No. 5 Holtzen, is good for 35 bbls. at 1,830 feet.

Burkburnett and Northwest.

Drilling—The Burk Cameron Oil Co.'s No. 6 Foster in shale at 1,655 feet; Godley Oil Co.'s No. 2 Foster rigging up to pump and test a sand at 1,830 feet; No. 1 Hrschi reset 5 3/16-inch with packer and shut down for orders at 1,913 feet; Gulf Production Co.'s No. 2 Dale standardizing at 1,806 feet; Humble Oil & Refining Co.'s No. 26 Shultz driving pipe, total depth 2,230 feet; Jetter Oil Co.'s No. 5 Myers drilling at 1,725 feet; McNalley and others' No. 1 Ramming fishing for a drill pipe at 1,475 feet; Magnolia Petroleum Co.'s No. 86 Reilly drilling at 1,145 feet; No. 87 Reilly drilling in brown shale at 1,855 feet; No. 88 drilling at 850 feet; Pigg Oil Co.'s No. 4 Hirschi standardizing on top of an oil sand at 1,875 feet; No. 5 Hirschi rigging up to pump and test a sand at 1,875 feet; No. 7 Hirschi drilling at 1,805 feet; No. 10 Hirschi drilling at 1,580 feet; Priddy and others' No. 1 Freeman drilling in mud at 1,315 feet; Scott Petroleum Co.'s No. 6 Kennedy drilling at 880 feet; the Sun Oil Co.'s No. 2 Hirschi trying to cut off water from a sand at 1,870 feet; No. 3 Hirschi junked hole at 1,400 feet, skidded rig 25 feet north and drilling at 785 feet; Sunshine State Oil & Refining Co.'s No. 1 Ramming pulling liner to shoot a broken sand at 1,710 feet; No. 3 Hirschi drilling at 1,410 feet; No. 1 Overall drilling at 1,510 feet, Brown and others' No. 1 Delaney drilling in blue shale at 1,620 feet; Invaders Oil & Refining Co.'s No. 1 Sides will set 6⅝-inch casing at 1,295 feet; Staley and others' No. 1 Cropper fishing for a bailer at 1,285 feet; Stump Oil & Gas Co.'s No. 3 Beach drilling at 1,110 feet.

Electra and Wichita.

The following completions are reported from the Electra Pool and Wichita County: Camp Oil & Gas Co.'s No. 4-B Douglas, 120 bbls. at 1,955 feet; The Texas Co.'s No. 5 Skinner, dry; the same company's No. 254 Waggoner, 155 bbls. at 1,970 feet; Magnolia Petroleum Co.'s No. 13 Brown, 15 bbls. at 1,975 feet; the same company's No. 1 Douglas, 20 bbls. at 1,075 feet; the Griswold Oil Co.'s No. 18 Burnett dry at 1,955 feet; Green & Dale's No. 9 Burnett, dry at 950 feet; Newman and others' No. 1 Smythe, dry at 2,025 feet; Texhoma Oil & Refining Co.'s No. 13-A Waggoner, 250 bbls. at 1,915 feet; Eggers and others' No. 1 Chilson, dry at 700 feet; Smith Haynes and others' No. 1 Ramming, dry at 1,775 feet; Steelsmith and others' No. 5 Parker, 70 bbls. at 1,270 feet; and Texhoma Oil & Refining Co.'s No. 2 Parker, dry at 1,305 feet.

Drilling—The Texas Co.'s No. 1 Flusche running 14-inch casing and cleaning out at 545 feet; No. 63 Hoanaker drilling in shale at 535 feet; No. 3 Sheldon running 4¼-inch casing and will drill deeper at 1,906 feet; No. 248 Waggoner underreaming at 1,907 feet; No. 251 Waggoner pulling a liner and reaming at 2,035 feet; No. 235 Waggoner drilling in lime rock at 1,960 feet; No. 255 Waggoner underreaming at 1,420 feet; No. 256 Waggoner drilling in shale at 1,555 feet; Gulf Production Co.'s No. 1-A Douglas rigging up a machine on top of sand at 1,527 feet; Humble Oil & Refining Co.'s No. 8-A Douglas rigging up standard tools at 1,902 feet; No. 10-A Douglas drilling in a sand at 1,798 feet; No. 1-B Douglas drilling in shale at 1,880 feet; Kruger and others' No. 4 Waggoner drilling at 890 feet; Mansfield and others' No. 1 Jennings ratholing in a sand at 1,600 feet; Magnolia Petroleum Co.'s No. 59 H. & T. C. drilling at 1,730 feet; Robinson and others' No. 1 Mitcham shot with 15 quarts and cleaning out at 1,975 feet; Soley and others' No. 2 Douglas drilling at 615 feet; Staley and others' No. 1 Detner drilling at 920 feet; Baldwin Brothers' No. 1 Waggoner rigging up to pump and test a sand at 1,645 feet; Bass and Dillard's No. 1 Waggoner, 700 feet of oil in the hole and cleaning out at 1,900 feet; No. 3 Waggoner, sand showing a little oil at 920 feet; pulling casing and will drill deeper; Carteret Oil Co.'s No. 10 Waggoner, two sands, one at 1,506 feet and one at 1,521 feet, shot with 30 quarts and only a small flow of oil resulted; Cochran and others' No. 2 Waggoner drilling at 710 feet; Culberson and others' No. 14 Waggoner will test a sand at 1,510 feet; Dixon and others' No. 1 Waggoner rigging up to pump and test a sand at 1,524 feet; Empire Gas & Fuel Co.'s No. 10-A Waggoner cleaning out and will bail and test a sand at 1,935 feet; Four States Oil Co.'s No. 3 Jennings drilling at 605 feet; Griswold Oil Co.'s No. 22-B Burnett drilling at 910 feet; No. 6-E Burnett fishing for a sand pump with sand showing some oil at 1,505 feet; No. 8-E Burnett drilling in sand and shale at 1,810 feet; Gulf Production Co.'s No. 1 Waggoner drilling at 1,370 feet; Hartford Trust Co.'s No. 10 Burnett drilling at 425 feet; Herford Oil Co.'s No. 7 Allingham drilling in shale at 1,010 feet; Houston Oil Co.'s No. 8 Waggoner drilling in hard rock at 1,725 feet; Ladd and others' No. 4-B Waggoner rigging up to test a sand at 700 feet; Lewis Oil Corporation's No. 4 Waggoner standardizing on top of a sand at 1,492 feet; No. 5 Waggoner standardizing on top of sand at 1,485 feet; Magnolia Petroleum Co.'s No. 18-A Waggoner will run 5 3/16-inch casing at 1,955 feet; No. 19-A Waggoner waiting for standard tools at 1,554 feet; No. 20-A Waggoner drilling in soft shale at 1,665 feet; McGregor and others' No. 3 Waggoner drilling at 715 feet; John O'Neil's No. 11 Waggoner will run 6⅝-inch casing to top of sand at 800 feet; Perkins and others' No. 2 Waggoner bailed and showed a little production from a sand at 1,841 feet; Rio Bravo Oil Co.'s No. 3-A Waggoner drilling at 1,840 feet; Shamrock Oil Co.'s No. 8 Waggoner rigging up a rotary; No. 11 Waggoner fishing for a drill pipe at 1,580 feet; No. 13 Waggoner standardizing on top of sand at 1,896 feet; Texhoma Oil & Refining Co.'s No. 15-A Waggoner drilling in shale at 1,285 feet; No. 2-E Waggoner drilling in lime at 1,775 feet; No. 3-E Waggoner drilling at 1,570 feet; Wakefield and others' No. 1 Waggoner ratholing at 1,445 feet; Wichita Petroleum Co.'s No. 67 Burnett rigging to drill in a sand at 1,946 feet; No. 77 Burnett drilling at 660 feet; Laughton and others' No. 1 Waggoner rigging up to drill an old hole deeper from 875 feet; Number Nine Oil Co.'s No. 2 Waggoner drilling at 1,675 feet, and Taylor and others' No. 1 Yarbrough rigging up to pump a sand with 800 feet of oil in the hole at 1,515 feet.

Young County.

Completions—Associated Oil Syndicate's No. 5 Herron, dry at 2,594 feet, and Union Oil Co.'s No. 2 Parsons, showing 2,000,000 feet of gas from a sandy lime at 4,010 feet.

Drilling—Buchanon and others' No. 1 Moren cleaning out to bottom at 3,141 feet; Carter and others' No. 1 Rubinkoenig drilling in shale at 1,875 feet; No. 1 Sanders is a rig; Colcord and others' No. 3 Kisinger drilling at 1,870 feet; Dyer and others' No. 2 Whittenburg spudding; Gulf Production Co.'s No. 3 Lisle is a rig; No. 1 Newby trying to plug back from 4,655 feet; No. 1 Hocaday fishing for casing at 2,325 feet; Harris and others' No. 1 Aller flowed 60 bbls. and drilling at 3,945 feet; Hemphill and others' No. 1 Hinson drilling at 2,210 feet; Julian and others' No. 1 Parsons drilling in lime at 3,735 feet; Kouri and others' No. 1 Sedden drilling in brown shale at 1,650 feet; Leader Oil Co.'s No. 1 Jarnigan drilling in black lime at 4,070 feet; McGuire & Hinson's No. 1 McPhearson drilling at 2,465 feet; Mann and others' No. 1-A Whittenburg a derrick; Dudley Miller's No. 1 Hughes underreaming 6⅝-inch casing at 3,110 feet; Monroe Oil Corporation's No. 1 Cox shot with 150 quarts without result from 3,965 to 4,040 feet; Nash and Windfor's No. 3 Williams drilling at 2,910 feet; Penn Cities Oil Co.'s No. 1-D Herron is a rig; Peters Oil Co.'s No. 1 Stewart drilling at 835 feet; Ralco Oil Co.'s No. 8 Driver drilling without results at 3,615 feet; No. 9 Driver has a fishing job at 3,980 feet; No. 10 Driver drilling at 1,710 feet; Roxana Petroleum Co.'s No. 1 Bunger fishing at 4,331 feet; No. 2 Bunger fishing for casing at 2,607 feet; Sacks and others' No. 4-A Williams had a sand at 1,730 feet that showed 1,000,000 feet of gas and 35 bbls. of oil and will side ream and drill deeper; No. 1-C Williams has 5,000,000 feet of gas and a water flow from a sand at 2,995 feet; No. 1-C Riverbed drilling at 1,160 feet; Schimmell and others' No. 1 Riverbed pulling big pipe, topped sand at 2,505 feet; Seaboard Oil & Gas Co.'s No. 1 Whittenburg set 8¼-inch casing at 2,330 feet; Shamrock Oil Co.'s No. 1 Bower is a rig; Simmons and others' No. 2 Herron shot with 20 quarts at 2,400 feet, and it responded with an estimated production of 75 bbls; Sinclair Oil & Gas Co.'s No. 1 Moren 4,000,000 feet of gas from a sand at 1,665 feet; No. 4 Kisinger drilling at 1,210 feet; Standard Petroleum Co.'s No. 1 McBrayer fishing at 3,780 feet; Taylor and others' No. 1 Costello plugging to abandon at 3,103 feet; Union Oil Co.'s No. 2 Lynn drilling in soft shale at 2,335 feet; No. 2 Whittenburg is a derrick; Whitehead and others' No. 1 Johnson underreaming 8¼-inch casing total depth 770 feet, and Whitehead and Hinson's No. 2-B McLaren is a rig.

Stephens County.

Completions—Mid-Kansas Oil & Gas Co.'s No. 4 Hill, dry at 3,246 feet; Republic Production Co.'s No. 3 Knox, dry at 3,448 feet; Gulf Production Co.'s No. 3 Kloh-Rumsey, 700 bbls. at 3,220 feet; Littlefield Oil Co.'s No. 1 Grante, dry at 4,100 feet; McCoy and others' No. 1 Townsend, dry at 880 feet, and Prairie Oil & Gas Co.s No. 2-B Gardenshire, 60 bbls. at 2,105 feet.

Eastland County.

Completions—Panhandle Refining Co.'s No. 1 Hightower, 20 bbls. at 1,220 feet; the same company's No. 1 Webb, 100 bbls. at 3,216 feet; States Oil Corporation's No. 2 Shamburger, dry at 3,670 feet, and Keough and others' No. 9 Gooch, 90 bbls. at 2,528 feet.

Miscellaneous.

Shackelford County — Completions — Barber and others' No. 4 Cook, 10 bbls. at 610 feet; Calloway and others' No. 3 Pritchard, 15 bbls. at 645 feet; Hill and others' No. 3 Pritchard 7 bbls. at 635 feet; Kendrick and others' No. 4 Carter, 10 bbls. at 635 feet; Kleiner and others' No. 1 Pritchard, dry at 700 feet; Revere Oil Co.'s No. 3 English, dry at 665 feet; Roxana Petroleum Co.'s No. 3 Rice, 12 bbls. at 550 feet; Scott and others' No. 2 Owens, 10 bbls. at 535 feet; Southern States Oil Corporation's No. 3 Pritchard, 12 bbls. at 635 feet.

Callahan County—Completions—Manley and others' No. 2 Wagley, 5 bbls. at 335 feet; Peoples Oil Co.'s No. 3 Hughes, dry at 510 feet; Peters and others' No. 1 Finley, dry at 650 feet.

Wildcats.

Palo Pinto County—Completions—Lone Star Gas Co.'s No. 5 Roberson, 10 bbls. at 1,550 feet; Upham and others' No. 1 Reasenor, 210 bbls. of oil and 15,000,000 feet of gas at 3,750 feet.

Brown County—Completions—Lobaugh and others' No. 1 Eddington, dry at 2,275 feet.

Archer County — Completions — The Delmar Oil Co.'s No. 4 Plowman, 30 bbls. at 1,015 feet; F. & H. Syndicate's No. 3-B Ferguson, 75 bbls. at 1,590 feet; Howard and others' No. 1 Wallace, dry at 700 feet; Iowa Park Oil Co.'s No. 3 Andrews, 3 bbls. at 910 feet; Iowa Park Producing Co.'s No. 1 Oil Corporation's No. 1 Taylor, dry at Edwards, dry at 1,910 feet; Kentucky 1,670 feet; Knight and others' No. 1 Jackson, dry at 1,810 feet; Texhoma Oil & Refining Co.'s No. 1 Getti, 150 bbls. at 1,780 feet, and White Oil Corporation No. 3 K. & K., 75 bbls. at 1,574 feet.

Drilling—Bass and others' No. 1 K. & K. drilling at 970 feet; Bradley Oil & Gas Co.'s No. 1 Ferguson drilling in shale at 1,460 feet; Burns Oil Co.'s No. 1 McGregor drilling at 1,860 feet; Burton and others' No. 1 Dycus drilling at 1,405 feet; Carter and others' No. 1 Ferguson drilling slowly and feeling ahead for a sand at 1,760 feet; Champion and others' No. 1 Ferguson drilling at 1,995 feet; Clark and others' No. 1 Mobley fishing for a bit at 1,720 feet; Cline Oil Co.'s No. 1 Edwards is a derrick; Comet Petroleum Co.'s No. 1 Ferguson drilling at 1,715 feet; Cumley and others' No. 1 Owens drilling at 490 feet; Dillard and others' No. 1 Campbell jarring on 8¼-inch casing at 850 feet; Dye and others' No. 1 Brown is a derrick; Electra Gulf Oil Co.'s No. 1-B Ferguson drilling at 1,350 feet; No. 2-B is a rig; F. & H. Syndicate's No. 11-A Ferguson drilling at 730 feet; Nos. 6 and 7-B are derricks; Green and others' No. 1 Edwards bailing and testing a sand at 1,018 feet; Gulf Production Co.'s No. 1-B Ferguson is a derrick; No. 2-A Ferguson has a small show of oil at 1,578 feet may drill a little deeper before testing; No. 5-D Ferguson has set 6⅝-inch casing at 1,590 feet; No. 3-E Ferguson drilling at 1,040 feet; Hudspeth and others' No. 1 Mankins coring a sand at 1,775 feet; Humble Oil & Refining Co.'s No. 1 K. & K. trying to seat casing at 1,772 feet; Iowa Park Producing

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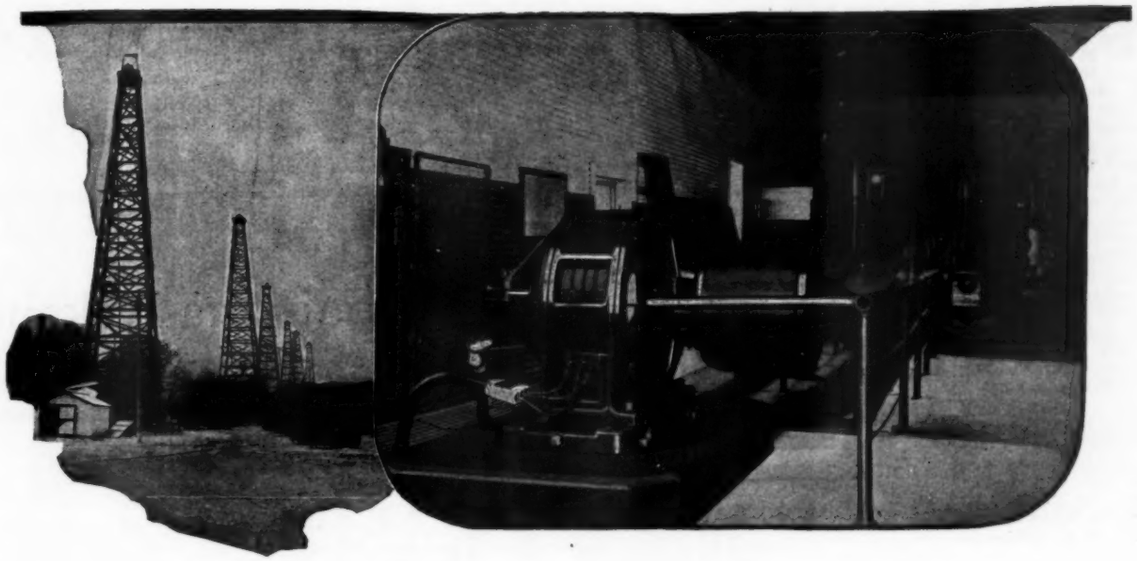

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Co.'s No. 2 Ferguson setting 6⅝-inch casing on top of a sand at 1,753 feet; No. 4-B Taylor drilling at 1,400 feet; No. 8-A Taylor drilling at 910 feet; Knight and others' No. 1 Abney is a rig; Lanning and others' No. 2-B Wilson has oil sand at 1,640 feet and will set 6⅝-inch casing and cement before testing; No. 3-B Wilson drilling at 1,430 feet; Patterson and others' No. 1 Wilson ratholing at 1,305 feet; Ray and others' No. 1 Ferguson drilling at 95 feet; Republic Oil Co.'s No. 1 Clift drilling at 1,130 feet; Richards and others' No. 1 Griffin is argi Center and others' No. 1 Mangold has 400 feet of fluid in the hole from a sand at 660 feet and is shut down for orders; Shappell and others' No. 2 K. & K. shut down on top of a sand at 1,776 feet; Shaw and others' No. 4 Ferguson has set 6⅝-inch casing at 1,711 feet; No. 2-A K. & K. passed up a sand showing some oil at 1,575 feet and drilling at 1,590 feet; Shipley and others' No. 1 White rigging up; Sibley and others' No. 1 Ferguson drilling at 310 feet; Simms Oil Corporation's No. 1 Knight, sand at 1,618 feet tested dry, drilling at 1,630 feet; No. 2 Ferguson testing a sand at 1,619 feet; Smith and others' No. 1 Netherton coring at 1,680 feet; Sunshine State Oil & Refining Co. testing a sand showing oil at 1,735 feet; Staley and others' No. 1 Ferguson moving in machine to complete at 1,585 feet; Texhoma Oil & Refining Co.'s No. 38 Gose drilling at 1,855 feet; No. 2-D Ferguson standardizing on top of a sand at 1,595 feet; No. 2-E Ferguson drilling at 1,010 feet; No. 2 Wilson drilling at 910 feet; No. 1-B Parkey drilling at 410 feet; No. 5-A Ferguson drilling at 1,365 feet; No. 3-B Ferguson moving in a machine to drill in and test a sand at 1,773 feet; No. 2 Wilson drilling at 1,555 feet; Thomas and others' No. 1 Wilson rigging up; Doctor Wallace's No. 1 K. & K. testing a sand at 1,750 feet; No. 2 K. & K. drilling at 210 feet, and Woodburn Oil Corporation's No. 1 K. & K. drilling at 110 feet.

Montague County.

The Texas Co.'s No. 1 Lemons is cleaning out to bottom at 2,705 feet; Boyd Oil Co.'s No. 1 Maddox shut down for cement to set at 891 feet; Mascho Oil Co.'s No. 1 Rowland spudding; Prime Oil Co.'s No. 1 Cook rigging up a rotary; Shocker and others' No. 1 Croxton drilling at 220 feet; Sheppard and others' No. 1-B Crenshaw underreaming 15¼-inch casing at 745 feet; Spencer and others' No. 1 Wilson shut down for casing at 387 feet; Staley and others' No. 1 McNatt rigging up a rotary; Tidal Oil Co.'s No. 1 Handley drilling at 1,060 feet and Timberlake and others' No. 1 Young building a standard rig.

Jack County.

Fortuna Oil Co.'s No. 1 Hallsell is drilling at 3,410 feet, and Ranger Oil & Gas Co.'s No. 1 Leatherwood sidereaming for 5 3/16-inch casing at 3,550 feet.

Clay County.

Campbell Oil Co.'s No. 1 Spivey is drilling at 1,235 feet; Dean and others' No. 1 Davidson moving in a rotary to drill deeper at 2,012 feet; Lone Star Gas Co.'s No. 10 Miller drilling at 890 feet; Nebraska Oil & Gas Co.'s No. 1 Myers shut down to standardize at 3,270 feet, and Panhandle Refining Co.'s No. 1 Craig lost slip in the hole at 1,089 feet.

Wise County.

Booneville Oil & Gas Co.'s No. 1 Castleberry is shut down for 12½-inch casing at 980 feet; Michigan Oil & Gas Co.'s No. 1 Young drilling at 2,305 feet, and Scott and Hunter's No. 1 Askey drilling at 2,105 feet.

Hutchinson County.

Capitol Partnership Pool's No. 1 Cockrell is spudding; Plaines Oil Co.'s No. 1 Weatherly underreaming 12½-inch casing at 897 feet, and Whittington and others' No. 1 Sanford drilling in lime at 2,625 feet.

Carson County.

Gulf Production Co.'s No. 3 Burnett is drilling in lime with a show of sulphur gas at 2,460 feet; Silk and others' No. 2 Bennett drilling in salt and red beds at 1,505 feet; Temple and others' No. 1 Harrell rigging up, and Tipton Stone and others' No. 1 McConnell drilling up a bailer at 2,590 feet.

PRODUCTION REPORT

Week Ending February 22, 1923

Burkburnett

American Refining Co.	435
Humble Oil & Refining Co.	885
Gulf Production Co.	1,220
Kansas & Gulf Co.	1,405
Magnolia Petroleum Co.	2,950
McMahon Oil Co.	740
Middle States Oil Co.	360
Oklahoma Petroleum & Gas Co.	480
Panhandle Refining Co.	570
Ryan Petroleum Co.	345
W. G. Skelly	325
The Texas Co.	1,010
Texhoma Oil & Refining Co.	655
Miscellaneous	13,000
Total	24,420

Stephens County

Empire Gas & Fuel Co.	95
Gulf Production Co.	2,920
Humble Oil & Refining Co.	2,250
Magnolia Petroleum Co.	1,670
Mid-Kansas Oil & Gas Co.	3,525
Prairie Oil & Gas Co.	1,865
Sinclair Oil Co.	315
The Sun Co.	595
The Texas Co.	4,425
T. & P. Coal & Oil Co.	1,510
Miscellaneous	11,130
Total	30,300

Electra

Empire Gas & Fuel Co.	2,730
Humble Oil & Refining Co.	310
Griswold Oil Co.	800
Gulf Production Co.	1,150
Magnolia Petroleum Co.	4,305
Middle States Oil Co.	1,440
The Texas Co.	5,730
Texhoma Oil & Refining Co.	1,170
Miscellaneous	5,220
Total	22,855

Eastland County

Gulf Production Co.	1,065
Humble Oil & Refining Co.	100
Magnolia Petroleum Co.	510
Mid-Kansas Oil & Gas Co.	40
Prairie Oil & Gas Co.	1,005
Sinclair Oil Co.	365
The Sun Co.	15
The Texas Co.	420
T. & P. Coal & Oil Co.	1,245
Miscellaneous	6,475
Total	11,740

Other Fields

Strawn—	
T. & P. Coal & Oil Co.	260
Miscellaneous	1,250
Moran—	
Empire Gas & Fuel Co.	535
Humble Oil & Refining Co.	350
The Texas Co.	275
Miscellaneous	1,340
Coleman County—	
Miscellaneous	85
Brown County—	
Miscellaneous	610
Comanche-Eastland—	
Humble Oil & Refining Co.	390
Empire Gas & Fuel Co.	30
Magnolia Petroleum Co.	1,300
Mid-Kansas Oil Co.	255
Prairie Oil & Gas Co.	125
The Texas Co.	505
T. & P. Coal & Oil Co.	245
Miscellaneous	5,800
Young County—	
Gulf Production Co.	220
North American Refining Co.	215
Oklahoma Petroleum Co.	140
Panhandle Refining Co.	390
Prairie Oil & Gas Co.	25
The Sun Co.	105
The Texas Co.	90
Miscellaneous	5,925
Mitchell County	250
Total	20,715

Iowa Park, Archer County and Petrolia

Iowa Park—	
Griswold Oil Co.	45
Gulf Production Co.	100
Middle States Oil Co.	15
Ryan Petroleum Co.	35
Texhoma Oil & Refining Co.	50
Miscellaneous	1,755
Archer County—	
Gulf Production Co.	195
The Texas Co.	205
Texhoma Oil & Refining Co.	2,205
Miscellaneous	2,825
Petrolia—	
Gulf Production Co.	135
The Texas Co.	105
Miscellaneous	200
Total	7,870
Total all fields	117,900
Total last week	114,510
Gain	3,390

North Louisiana-Arkansas

By M. L. VAUGHN

Imperial Oil & Gas Products Co. completed well in heavy oil district at Smackover estimated as making between 10,000 and 15,000 bbls. daily. Woodley Petroleum Co. brought in a 4,000-bbl. producer, which extended light oil district half a mile. Broderick & Calvert's well, which was largest producer in light oil district, has stopped flowing. Other fields quiet.

SHREVEPORT, La., Feb. 26.

Production figures for the past three weeks have remained practically at a standstill, with the Smackover Pool showing a small but steady decline. The Broderick & Calvert's well, the largest in the light oil district, has stopped flowing as have also two of its offsets, the Gulf Refining Co.'s No. 1 Rigdell and Phillips and others' No. 1 Murphy. It is not known whether the wells have sanded up and bridged over or if their failure to flow is caused by a diminuition of gas pressure but, at any rate, it is a hard blow to the Smackover Pool.

Runs for the week averaged approximately 160,020 bbls. a day, of which 67,585 bbls. was from north Louisiana and 92,435 bbls. from southern Arkansas, as follows:

North Louisiana

	Bbls.
Caddo light	8,000
Caddo heavy	2,120
De Soto and Red River	5,860
Elm Grove	1,010
Haynesville	34,800
Homer	10,035
Bellevue	5,760
Total	67,585

South Arkansas

El Dorado	13,740
Calion	4,090
Smackover light	4,870
Smackover heavy	69,330
Stephens	505
Total	92,435
Total both districts	160,020
Last week	160,670
Decrease	650

The Imperial Oil & Gas Products Co.'s second big well on the McClanahan lease in Section 6-16-15 has proved one of the best wells in the heavy oil district at Smackover. It is flowing through two 6-inch flow lines into earthen storage at the well, from it is pumped by the Standard Oil Co. to storage tanks in the north end of the field and is estimated at from 10,000 to 15,000 bbls. a day.

Featuring the development of the past week was the completion of the Woodley Petroleum Co.'s No. 1 Anderson, SW cor. NE NE, Section 33-15-13. The well came in at 1,990 feet and gauged 4,000 bbls. It extends the light oil district half a mile northeast and brings the production to within 2 miles of the heavy oil district in the original Smackover Field. The well is making 27 gravity oil, which is now priced at 1.35 a barrel.

Purchase of a 40-acre lease in the east El Dorado Field by the Haskell interests for a consideration of approximately $100,000 is considered a forerunner of an extensive drilling campaign in this territory. Development of the East Field has been quiet, but an extensive pool of light oil has been developed in this territory and although the wells are small, compared with the gushers in the North Field, they are long lived and at the present price of oil are attracting increased attention and interest. The property was purchased under the name of the Sure Oil Corporation, a subsidiary of the Southern States Oil Corporation, and consists of 40 acres and two producing wells in Section 20-17-14.

The Atlantic Oil Producing Co. has completed a pipe line from the Stephens Field in Columbia County, Arkansas, to its loading rack on the L. & N. W. Railway and made its first shipment of 15 cars on February 20. This is the largest single shipment of crude that has yet been made from the Stephens Field.

Smackover Completions

Union County Area.—The largest production to date obtained from the Union County area of the Smackover district was recorded last week with the completion of eight wells aggregating an estimated initial daily production of 13,470 bbls. The most important and surprising well of the week was completed by the Woodley Petroleum Co., in Section 33-15-16, half a mile north of Patt Marr's well on the LeCroy lease, and 2 miles directly west of the Arkansas Natural Gas Co.'s No. 269 Spahr. The Woodley well came in flowing 4,000 bbls. of oil from 1,990 feet, and serves to discredit the prevalent opinion that no big production will be obtained from the northern edge of the field.

Danciger and associates completed a well on the Parnell lease, in Section 9-16-16, flowing 250 bbls. at 2,020 feet. The well offsets the Atlantic Oil & Producing Co.'s big well to the southeast. Four wells were brought in in Section 6-16-15, all of them located in the north half of the section near producing wells. The A. & M. Oil Co. completed No. 1 James, flowing 300 bbls. at 1,990 feet. Crawford & Sebastian completed No. 1 James, flowing 800 bbls. of oil and making 15,000,000 cubic feet of gas at 1,987 feet. The Imperial Oil & Gas Co. brought in No. 4 McClanahan, flowing 6,000 bbls. of oil at 1,990 feet, the second 6,000-bbl. producer they have completed on this lease. The Standard Oil Co. completed No. 1 McClanahan, flowing 120 bbls. at 1,995 feet.

The Gulf Refining Co. completed No. 3 McDonald, Section 1-13-16, flowing 1,000 bbls. from 1,995 feet, and offsets the Sun Oil Co.'s No. 1 Primm in the same section, which came in this week making 1,000 bbls. of oil at 1,995 feet.

Ouachita County Area

Fourteen wells were completed in the Ouachita County area of the Smackover district, with a total estimated initial production of 15,615 bbls. of oil and 15,

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Cow-Foot Rasps
Hollow Reamers
Solid Reamers
Casing Rings and Slips
Casing Rippers
Sinkers
Bell Sockets
Combination Sockets
Corrugated Sockets
Jar-Down Sockets

Slip Sockets
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Marietta, Ohio
El Dorado, Kansas
Florence, Kansas
Augusta, Kansas
Madison, Kansas

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000,000 cubic feet of gas. All the wells were located in the proven area of the field, most of them offsetting production. Two large wells were completed in Sectin 28-15-15, on the north and east edge of the field, the Humble Oil & Refining Co.'s No. 4 Hildebrand flowing 5,000 bbls. at 2,060 feet, and the Pure Oil Co.'s No. 3 Brister flowing 4,000 bbls. at 2,045 feet. In Section 33-15-15, the Sinclair Oil Co. completed No. 1 Berry, just east of its No. 2, flowing 4,000 bbls. of oil at 2,060 feet.

The remaining wells are under 1,000 bbls. production. In Section 32-15-15, Bailey and associates completed No. 2 Rhoten, flowing 700 bbls. at 2,045 feet, and the Standard Oil Co. brought in No. 3 Umpstead, flowing 100 bbls. of oil and 15,000,000 cubic feet of gas at 2,035 feet. The Edmonson Mineral Deeds Co. completed No. 3 McKenzie in the heart of production, Section 36-15-16, flowing 300 bbls. of oil at 2,010 feeet. In the same section, R. J. McMurray completed No. B-2 Laney, swabbing 75 bbls. of oil at 2,010 feet; the Simms Oil Co. brought in No. A-5 McKenzie, pumping 150 bbls. at 2,045 feet, and The Texas Co. completed No. 6 McKenzie, swabbing 75 bbls. at 2,000 feet.

Olvey and associates completed No. 8 McDonald, Section 1-16-16, flowing 400 bbls. at 2,005 feet. The Roxana Petroleum Co. completed No. 1 Berg Bros., Section 28-15-15, flowing 100 bbls. at 2,050 feet. The Simms Oil Co. completed No. 1 Gaskin, flowing 300 bbls. at 2,040 feet. The Sinclair Oil Co. completed No. 2 F. A. Laney, making 15 bbls. from 2,025 feet and, the Sun Oil Co. brought in No. 3 Johnson, Section 30-15-15, flowing 400 bbls. at 2,015 feet.

Drilling Operations

Union County Area.—Most of the activity in the Union County area of the Smackover district is located in and around Section 9 and 10-16-16, and a large number of tests were started in this territory last week. A summary of operations in Union County, including the East Field and El Dorado districts, shows 17 wells waiting standard rig, 25 tests temporarily abandoned, 11 drilling, 25 rigged up, 81 derricks and 8 locations.

In Section 9-16-16, where Danciger and others completed another good producing well this past week, probably more activity is noted than any other portion of the field. Allison and others have a rig up for No. 2 Rigdell; Cargile and others are drilling at 1,725 feet in No. 3 Saxon; Danciger and others are building derrick for No. 2 Parnell; Hill, Meyers and others are rigging up No. 1 Goodwin; the Humble Oil & Refining Co. has 10-inch casing set at 155 feet in No. 1 Meakin; M. L. Hunt and others have set 10-inch casing and drilled to 600 feet in No. 1 Goodwin; the Gulf Refining Co. is down 50 feet in No. 2 Rigdell, has 10-inch casing set at 235 feet in No. 3, and rigging up to drill No. 4.

Walter Luck has derrick up for No. 1 Saxon, Section 9-16-16. Harry Morris, trustee, has set 6-inch casing at 1,915 feet in No. 1 Saxon The Phillips Petroleum Co. tested No. 1 Childs dry at 2,025 feet, with a show of oil, and is now swabbing. Riley and others have rig up for No. 1 Saxon. The Sun Oil Co. is down 1,930 feet in No. 1 Saxon. Thraves and others have set 10-inch casing at 145 feet in No. 1 Goodwin and have derrick up for No. 2. Travis and others are drilling at 20 feet in No. 1 Parnell.

In the adjoining section to the east, 10-16-16, where Broderick & Calvert got a good producer on the west edge, which has recently gone dead, a number of tests are under way. Anderson and others have derrick pattern on location for No. 1 Tatum. The Arkansas Invincible Oil Corporation has 6-inch casing set at 1,950 feet in No. 1 Meakin, running core barrel at 1,997 feet in No. 2, rigging up No. 3, and has derrick built for No. 4. The Arkansas Natural Gas Co. has set 8-inch casing at 2,017 feet in No. 1 Murphy, and has derrick up for No. 2. Broderick & Calvert have three tests drilling on the Murphy lease and have rig up for No. B-2 Burns and others have set 6-inch casing at 2,020 feet in No. 1 Crowder. The Federal Petroleum Co. is drilling at 1,300 feet in No. 1 Hedgewood. Hubert and others have set 6-inch casing at 2,005 feet in No. 1 Harris. The Kirby Oil Co. has set 12½-inch casing at 135 feet in No. 1 Goodwin. The Magnolia Petroleum Co. is down 1,445 feet in No. 2 Hedgewood. Patt Marr is waiting water at 800 feet in No. 1 Hugus and is rigging up Nos. 2 and 3. He has rig up for No. 1 Tatum, same section. McPhail and others are drilling at 1,200 feet in No. 1 Crowder. Harry Morris, trustee, has three tests under way on the Hugus lease and is down 1,240 feet in No. 1 McAdoo.

In the same section, 10-16-16, the Phillips Petroleum Co. has rig up for No. 2 Murphy and derrick built for No. 3. Neal Scroggins is down 820 feet in No. 1 Crowder. The Smackover Petroleum Co. is drilling at 1,710 feet in No. 1 Harris. The Smackover Rainbow Oil Co. is down 400 feet in No. 2 Hugus. The Smith Oil Co. tested 4,000,000 cubic feet of gas at 2,062 feet in No. 1 Key and is arranging to go deeper. Williams and others have set 10-inch casing at 135 feet in No. 1 Hugus.

Ganzell and associates are awaiting standard rig at 2,620 feet for No. 2 Leverett, which stands with 1,100 feet of oil in the hole from 11 feet of sand. The well is located about 2 miles east of Broderick & Calvert's well, in Section 11-16-16. The Gulf Refining Co. has derrick pattern on location for No. 4 McDonald, Section 1-16-16, offsetting production. In the same section, where a number of good wells have been completed, Riley and others have set 8-inch casing at 1,897 feet in No. 2 Primm. The Roxana Petroleum Corporation has set 8-inch casing at 1,890 feet in No. 1 Primm.

Other Drilling Operations

In Section 5-16-16, just west of Clark & Melat's Doc Saxon well and northwest of the producers in Section 9, the Gulf Refining Co. tested No. 1 C. L. Saxon dry with a show of oil at 2,255 feet and has drilled to 2,280 feet. Smitherman & McDonald are trying to kill a gas blowout at 1,978 feet in No. 2 Saxon. Pat Marr tested 3,000,000 feet of gas at 2,060 feet and has drilled to 2,365 feet in No. 1 Green, Section 3-16-16, and has set 6-inch casing at 2,605 feet in No. 1 Mason, same section, about a mile and a half east of the Doc Saxon well. McDuff, trustee, is drilling at 1,450 feet in his test on the Huston lease, Section 12-16-16, a little over a mile south of the production in Section 1. Lockhart and others have made locations for Nos. 1 and 2 Wilson in Section 6-16-16, 2 miles west of the light production. The Simms Oil Co. has set 8-inch casing at 1,910 feet in No. 1 Childs, Section 8-16-16, just west of the new production in Section 9.

The A. & M. Oil Co. tested No. 2 James dry with a show of oil at 1,995 feet and will drill deeper, Section 6-16-15, where some of the best wells in the district are now being completed. In the same section, the Amerada Petroleum Corporation has derrick pattern for No. 1 Flenagan. The Arkansas Natural Gas Co. has temporarily abandoned No. 1 Ferguson at 2,021 feet and has rigs up for Nos. 2 and 3. Crawford & Sebastian have set 6-inch casing at 1,900 feet in No. 2 James and have derricks built for Nos. 3 and 4. The Imperial Oil & Gas Co. has started drilling No. 3 McClanahan. The Mercury Oil Co. has rig up for No. 1 Flenagan. John L. Nelson is rigging up No. 1 McClanahan. Parish and others have set 15½-inch casing and drilled to 725 feet in No. 1 Ferguson. The Standard Oil Co. tested 8,000,000 feet of gas and 1 bbl. of oil at 1,980 feet in No. 2 McClanahan and will drill deeper. It has derrick up for No. 4. The Vitex Oil Co. has rig up for No. 1 McClanahan. The Arkansas Invincible Oil Corporation is down 1,087 feet in its test on the McRea lease, Section 16-16-16, a mile south of the production in Section 9.

The Gladys Belle Oil Co. is drilling at 1,400 feet in No. 1 Cook, Section 16-16-15, one-half mile northwest of the Dunn gasser. In the same section, SE cor. SW NE, the Gulf Refining Co. has made location for No. 1 Cook. The Gulf Refining Co. has set 6-inch casing at 1,860 feet in No. 2 Meakin, Section 33-15-16, where the Woodley Petroleum Co. completed a 4,000-bbl. well this past week. In this same section, the Magnolia Petroleum Co. is bailing to test No. 2 Meakin at 1,952 feet. The Texas Co. has set 15-inch casing and drilled to 900 feet in No. 2 Bradley. Y. E. Hildreth has drilled his test on the Smith lease at 2,380 feet. It is located in Section 2-16-17, several miles west of production.

The Humphreys Oil Co. is drilling at 1,600 feet in No. 1 Massey, Section 17-16-15, a mile southeast of the Oil Operators Trust's gas well. The McPhail Oil Co. has set 15¼-inch casing at 55 feet in No. 1 Sid Umpstead, Section 4-16-15, about a mile and one-half southeast of the producing area and from the production in Section 6-16-15. The Ohio Oil Co. is drilling at 2,900 feet in No. 1 Gordon, Section 16-16-17, 2 miles south and approximately 5½ miles west of the Atlantic producer. The Preston Oil & Gas Co. has made location for No. 1 Flenagan, Section 5-16-15, just south of the production in Section 6.

Ouachita County Area

Most of the activity in the Ouachita County area of the Smackover district is in proven territory, but a number of interesting wells are being drilled. A summary of operations last week shows 15 wells waiting standard rig, 3 tests temporarily abandoned, 65 drilling, 13 rigged up, 14 derricks and 8 locations.

R. E. Allison is drilling at 1,180 feet in No. 1 Lewis, Section 35-15-16, just west of the big production in Section 36. The Atlantic Oil & Producing Co. is drilling three tests on the Berg Brothers' lease, Section 30-15-15, in the heart of production. The Simms Oil Co. is rigging up to drill No. 2 Gaskin, same section. Brummett and others have abandoned the location for No. 2 Flannagan in Section 6-16-15. In the same section, the El Dorado Drilling Co. is drilling at 1,980 feet in No. 1 Flannagan. The Humble Oil & Refining Co. has two wells under way on the Flannagan lease. H. K. Tarver has set liner at 2,010 feet in No. 1 Flannagan. The Vitex Oil Co. is drilling at 1,300 feet in No. 1 Flannagan. Burton, trustee, tested 25,000,000 feet of gas at 1,952 feet in No. 1 Hughes and is now arranging to test at 2,010 feet, Section 28-15-16, a mile and one-quarter north of Woodley's producer. Near Stephens, Clark & Greer are rigging up to drill No. 1 Hamilton, Section 19-15-19. The Ohio Oil Co. has set liner at 2,170 feet in No. 1 Hall, Section 31-15-19, and the Standard Oil Co. is drilling at 2,080 feet in No. 1 Watson, Section 20-15-19. Jimmy Cox tested a show of gas and salt water at 1,955 feet in No. 1 Ferris Burton, Section 30-15-17, several miles west of production.

The Edmonds Mineral Deeds Co. is drilling at 1,770 feet in No. 4 Laney, Section 31-15-15, in the heart of the producing area. In the same section, the G. & G. Syndicate is drilling at 1,200 feet in No. 3 Laney; at 2,045 feet in No. 4 and has derrick up for No. 5. The Gladys Belle Oil Co. is down 1,490 feet in No. 3 Laney; rigging up No. 5 and down 20 feet in No. 8. The Houston Oil Co. is drilling three tests on the Laney lease, Nos. 6, 7 and 8. The Humble Oil & Refining Co. is drilling four tests on the F. A. and B. T. Laney lease and has derrick up for No. 8. The Noco Petroleum Co. has three rigs running on the Laney lease and is rigging up No. 6. The Simms Oil Co. has drilled to 905 feet in No. 6 F. A. Laney. The Texas-Pacific Coal & Oil Co. tested salt water and oil at 2,050 feet in No. 4 Laney and has shut down waiting orders, Section 31-15-15.

Dulaney-Holmes have set 6-inch casing at 1,900 feet in No. 9 McKenzie, Section 36-15-16, where some of the best wells of the field have been completed. In the same section, the Empire Gas & Fuel Co. is down 1,960 feet in No. A-3 Laney. Richard Rader has set 10-inch casing and drilled to 300 feet in No. 4 McKenzie. The Simms Oil Co. has rig up for No. A-6. The Sinclair Oil Co. has set 6-inch casing at 1,850 feet in No. B-3 Linahan and is down 1,350 feet in No. 4.

The Mutual Oil Co. has derrick up for No. 1 L. Grayson, Section 30-15-19, near the Stephens Field. Olvey and others are waiting standard rig at 2,005 feet for No. 7 McDonald, Section 1-16-16, where several wells have been completed as good producers. The Pure Oil Co. has two rigs running on the Brister lease, Section 28-15-15. In the same section, the Roxana Petroleum Corporation is down 1,155 feet in No. 4 Murphy. The Simms Oil Co. has set 6-inch casing at 1,895 feet in No. C-2 Berg Brothers, Section 32-15-15, in the heart of the producing field. In this same section, it is bailing liner to reset at 2,020 feet in No. 4 Reynolds with a small show of gas; the Standard Oil Co. is down 2,030 feet in No. 1 A. Forch and is drilling at 1,350 feet in No. B-4 S. Umpstead.

In Section 29-15-15, the Simms Oil Co. is swabbing to test No. 4 Nanny Murphy at 2,045 feet. The Smackover Petroleum Syndicate is drilling at 1,810 feet in No. 1 Graves, Section 8-14-8, wildcat territory, and Sutton and others are down 20 feet in No. 1 Jeffus, Section 24-14-18. The Texas Co. has set 6-inch casing at 1,925 feet in No. 2 A. Berry, Section 33-15-15, on the east edge of production. The Vitex Oil Co. has set 6-inch at 1,830 feet in No. 1 Shivey, Section 28-15-16, about 2 miles from production. Woodley and associates have drilled to 20 feet and shut down their new well on the Umpstead lease, Section 4-16-15, southeast of production.

El Dorado District

Union County.—Five wells were completed in the El Dorado district last week, four in the East Field and one in the Constantin territory. Bogger and others brought in No. 1 Smith, Section 20-17-14, pumping 125 bbls. at 2,180 feet, 18 per cent basic sediment. In the same section, the Gulf Refining Co. completed No. A-1 C. L. Saxon, pumping 120 bbls. at 2,220 feet, and D. C. Richardson completed No. C-2 Murphy, pumping 150 bbls., 18 per cent salt water. In Section 29-17-14, Pitcher and others completed No. 1 Smith, pumping 150 bbls. at 2,225 feet, 15 per cent salt water. In the Constantin territory, the Standard Oil Co. abandoned No. 202 Hill, Section 1-18-16, at 3,050 feet.

Drilling Operations

Most of the interesting drilling activity of the El Dorado district is located in the East Field and the Constantin territory, but a number of wildcat tests are being drilled which are attracting considerable attention. In the East Field, Bogger and others have set 6-inch casing at 2,140 feet in No. 2 Smith, Section 20-17-14. The Gulf Refining Co. has set 10-inch casing and drilled to 2,080 feet in No. A-2 C. L. Saxon, same section, and has set 10-inch casing at 205 feet in No. 2 Polk & Ezell, Section 18-17-14. Mayo and others are down 685 feet in No. 2 Moody, Section 19-17-14. Moran & Carey are arranging to pump No. 2 Smith at 2,170 feet; set 6-inch casing at 2,160 feet in No. 3 and are building derrick for No. 4, Section 20-17-14. John L. Nelson has set 10-inch casing and drilled to 1,895 feet in No. 2 Allen and has derrick built for No. 3, Section 18-17-14.

In the Constantin territory, a number of tests are under way. The El Dorado Natural Gas Co. is drilling at 3,315 feet in No. 2 Mellor, Section 1-18-16. Morgan and others are waiting standard rig to pump No. 2 Mellor, which stands 2,300 feet in fluid, 15 per cent salt water, at 2,910 feet, Section 1-18-16. The Transcontinental Oil Co. is running core barrel at 2,990 feet in No. 1 Sorrell, Section 33-17-16, and the Constantin Oil & Refining Co. has set 6-inch casing at 2,900 feet in No. 2 fee, Section 1-18-16. In the old south field, the Forest Oil Co. is rigging up to drill No. 1 Cobb, Section 5-19-15. The Skelly Oil Co. is drilling at 1,330 feet in No. 1 Hall, Section 3-19-15. The White Oil Corporation is setting 6-inch casing at 2,970 feet in No. 1

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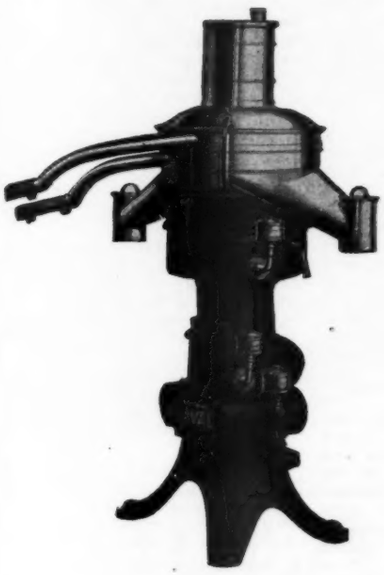

Steam-turbine driven De Laval Crude Oil Purifier. They are also furnished for belt or electric motor drive. Note the vapor-tight feed and discharge connections with which they are equipped.

Long before buying crude on a gravity basis was seriously talked of, De Laval Crude Oil Purifiers had proved their ability to almost eliminate evaporation losses in treating cut production.

Here is what they have done on one lease in the Mid-Continent Field: The fluid as it comes from the well is about 38 degrees Be., and contains 40% emulsion. Steaming and settling had failed to bring the fluid to less than 5% b. s., and this treatment lowered the gravity of the crude four to six degrees.

De Laval Crude Oil Purifiers were installed with the hope that they would not only reduce the b.s. content of the oil to pipe line requirements, but also keep the gravity of the crude at 37 degrees Be. or higher so as to get a premium of 25 cents a barrel, which was then in effect. They were successful in both cases. The purified crude showed less than one-half of one per cent b. s., and a loss of gravity amounting to but two-tenths of one per cent.

Under the new schedule this crude will bring $1.60. Even if heating and settling had made it acceptable to the pipe lines, the evaporation loss would have reduced its value to $1.10 or $1.25 a barrel.

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Armstrong, Section 31-17-15. The Standard Oil Co. has rig up for No. 1 Miles, Section 16-18-13.

Bellevue-Bossier Parish

The Standard Oil Co. has a show of oil and salt water at 400 feet in No. 9 T. F. Bell, Section 16-19-11, and has derrick up for No. 4 Weaver in Section 14-19-11. George Weatherbee has made a location for Bliss Weatherbee's No. 1 in Section 15-19-11.

De Soto Parish

The Fortuna Oil Co. completed a 5-bbl. pumper at 2,743 feet in No. 9 Giauque, Section 33-12-11, and has set 6-inch casing at 2,605 feet in No. 10 in the same section. The Texas Co. is drilling at 2,550 feet in No. 1 Lanier Land & Oil Co., Section 33-22-11, and A. H. Tarver and others are drilling at 1,875 feet in No. 1 Matthews, Section 32-12-11. Six miles north of Logansport, the Pilgrim Oil Co. is down 4,656 feet in its deep test on the Ramsey lease in Section 34-13-16. It had a slight showing of oil at 4,628 feet.

Red River Parish

The Fortuna Oil Co. completed No. 56 Pugh, Section 12-12-11, flowing at the rate of 15 bbls. a day at 2,800 feet.

Caddo Parish

Rowe and others have abandoned their test on the Kendrick lease, Section 33-21-13, in the north end of Caddo Parish, after testing dry at 3,245 feet. The Standard Oil Co. of Louisiana tried to deepen the hole in an old well on the Stiles lease, No. 84, Section 21-21-16, but junked the hole and the test has been abandoned at 2,630 feet. J. E. Brown and others have set 4½-inch casing at 2,650 feet in a deep test in No. 2 Noel, Section 13-21-15; the Caddo Central Oil & Refining Co. is drilling at 2,960 feet in No. 40 State fee, Section 13-21-16, and the Gulf Refining Co. is arranging to abandon No. 8 Herndon, Section 15-21-15, at 3,000 feet. The Dixie Oil Co. is drilling at 560 feet in No. 6 Clark, Section 14-21-15; has set 6-inch casing at 1,412 feet in No. 7 Caddo Mineral Land Co., Section 23-21-15, and is down 2,812 feet in No. 4 Robertshaw, Section 13-21-15, an old well being deepened.

The Fendrick Syndicate is drilling at 1,410 feet in No. 1 Lans and others, Section 28-22-16, in the Hosston heavy oil district. The La-Tex Community Oil Co. is down 225 feet in No. 1 Thompson, Section 34-23-16. The Mitchell Oil Corporation is drilling at 1,205 feet in No. 1 Mitchell, Section 11-16-14. The Old Settlers Oil Co. is down 1,770 feet in No. 2 Como, Section 13-21-15, in the Pine Island district. The Simms Oil Co. is drilling at 1,300 feet in No. 1 W. E. Noel, Section 7-21-14. The Texas Co. is down 1,430 feet in No. 56 Caddo LB, Section 33-21-16. Tarver & Bashara have set 10-inch casing and drilled to 1,020 feet in No. 7 Logan, Section 22-21-15. Clark & Greer are deepening an old well on the extreme east edge of the Pine Island district, their No. 2 Noel, and the operation is being closely watched, Section 19-21-14.

Claiborne Parish

Four wells were completed in Claiborne Parish the past week, three pumpers and one failure. The Gilliland Oil Co. completed No. 6 T. W. Sherman, Section 10-23-8, on the north edge of the field, pumping 50 bbls. at 2,810 feet. The Ohio Oil Co. completed No. 25 Garrett and others, Section 24-23-8, pumping 75 bbls. at 2,850 feet, and No. 6 Seegers Section 9-23-8, pumping 100 bbls. at 2,825 feet. Tigner and others completed contract and abandoned No. 1 Moseley at 3,010 feet, Section 14-20-6, several miles from production. Very few interesting tests are being drilled in Claiborne Parish at this time. Cox and others have rig up for No. 1 Craighead, Section 28-20-6, several miles east of production. The Bloak Oil & Gas Co. has set 10-inch casing and drilled to 410 feet in No. 1 Aubrey, Section 20-21-8, near the Homer production.

The Es-To Oil Co. is drilling at 2,225 feet in No. 1 Tuggle, Section 31-21-16. The Lisbon Syndicate has derrick up for No. 1 Caruthers, Section 15-21-15. The Louisiana Oil Refining Corporation is waiting standard rig to pump at 2,805 feet in No. 5 T. W. Sherman, Section 10-23-8, in the proven area of the field; the Ohio Oil Co. has set 10-inch casing at 165 feet in No. 4 Camp, Account 2, Section 24-23-8; drilling at 1,250 feet in No. 20 Hunt, Section 16-23-8; drilling at 2,075 feet in No. 1 T. B. Lee, Section 26-23-8, and set 10-inch casing at 95 feet in No. 7 Seegers, Section 9-23-8. Morris and others are down 1,500 feet in No. 1 W. L. Fields, Section 22-19-5, several miles east of production. Ziegan & Bender have rig up for No. 2 Hamiter (formerly reported No. 1, which was junked), Section 13-20-8. A summary of the Claiborne Parish operations at the close of the week shows 3 wells waiting standard rig, 4 tests temporarily abandoned, 10 drilling, 3 rigged up, 6 derricks and 2 locations.

Louisiana Wildcats

Bienville Parish.—The Acadia Syndicate set 8-inch casing with packer at 1,428 feet and has set liner to test at 1,890 feet in No. 1 Anderson, Section 29-18-5, in the southwest corner of the parish.

Bossier Parish.—No wells were completed in Bossier Parish last week, but a number are under way. The Brannon Oil Co. has set 10-inch casing at 205 feet in No. 1 Bollinger, Section 18-22-11. Collins and others are arranging to abandon No. 1 Gray at 3,269 feet with no showing of oil or gas, Section 28-19-13, 12 miles south of the Bellevue production. The Gulf Refining Co. is moving in rig for No. 16 Hodges, Section 24-16-12, and is waiting standard rig to pump No. 15 at 1,557 feet, both located in the Elm Grove district. Sales & Walker are down 1,070 feet in No. 1 Bollinger, Section 32-23-11, and the Tarver Brothers Petroleum Co. has set 8-inch casing at 325 feet in No. 1 Bollinger, Section 15-22-14.

Lincoln Parish.—The Roxana Petroleum Co. is drilling at 3,110 feet in No. 1 Thomas, 3 miles west of Ruston, Section 24-18-4w.

Morehouse Parish.—Morris, trustee, completed No. 11 Crossett Lumber Co., Section 30-21-5e, making 2,500,000 feet of gas at 2,240 feet. In Section 27-20-5e, The Texas Co. completed No. 1 Atkins, making 7,500,000 feet of gas at 2,285 feet. Ladell and others have rig up for No. 6 fee, Section 27-20-5e, and in Section 33-20-5e, they are drilling at 210 feet in No. 1 W. W. White. The Mohawk Oil Co. is drilling at 2,340 feet in No. 1 Marlett, Section 19-20-6. The Ouachita Natural Gas Co. is arranging to set 6-inch casing at 2,190 feet in No. 6 Allison, Section 7-20-5e.

Ouachita Parish.—Four wells were completed in Ouachita Parish last week, all gassers. Barbour and others completed No. 1 Barbour, Section 27-19-5e, making 7,000,000 feet of gas at 2,305 feet. Easterling, trustee, completed No. 1 Bogh, Section 28-19-5e, making 10,000,000 feet of gas at 2,235 feet, and the Standard Carbon Co. completed No. 1 Walker, Section 32-19-5e, making 37,000,000 feet of gas at 2,210 feet. The Atlas Oil Co. completed No. 1 Walker, Section 32-19-5e, making 37,000,000 feet of gas at 2,215 feet. The same company is arranging to set 12½-inch casing at 875 feet in No. 2 West Virginia Timber Co., Section 3-18-5e.

Hatcher & Evans are rigging up to drill No. 2 fee, Section 17-19-4e. Ladell and others are rigging up to drill No. 1 J. R. White, Section 28-20-4e. The Southern Carbon Co. has set 8-inch casing at 1,060 feet in No. 17 fee, Section 33-19-5e. The Union Gas & Power Co. has 6-inch casing set at 2,130 feet in No. 1 Daughtie, Section 35-19-5e. The Z. & B. Drilling Co. has set 6-inch casing at 2,115 feet in No. 1 Meuch, Section 28-19-5e, and Ziegen and others have set 14½-inch casing at 250 feet in No. 1 Michim, Section 7-20-5e.

Sabine Parish.—Brown and others are drilling at 2,695 feet in No. 1 Bowman Hicks Lumber Co., Section 7-7-12. Collins and others have shut down No. 1 Anthony at 415 feet, Section 12-4-13. The Gladys Belle Belmont Oil Co. is retesting No. 1 Raines at 3,750 feet after testing a show of gas at 3,626 feet, Section 33-9-11.

Webster Parish.—Snyder & Roy are drilling at 2,530 feet in No. 1 Moore, Section 13-19-9. The Palmer Corporation has made location for No. 1 R. H. Miller in Section 29-21-10.

Southern Arkansas

The Stephens Field in Columbia County, Arkansas, can no longer be looked upon as a wildcat territory since a well defined pool has been developed in this territory with an average daily production of more than 500 bbls. The wells are all small pumpers, but the producing area is being steadily extended. During the past week, Bradstreet and others completed their first well on the Miller lease in Section 24-15-20, pumping 115 bbls. at 2,180 feet. The only other completion was the Atlantic Oil & Producing Co.'s No. 1 Webfer, in which the hole was junked at 2,115 feet and the test abandoned.

The Atlantic Oil & Producing Co. is drilling at 1,450 feet in No. 2 Webfer, Section 24-15-20, 2 miles west of Stephens, and has set 8¼-inch casing at 2,070 feet in No. 1 Jackson, Section 23-15-20. In Section 23, the Gulf Refining Co. is rigging up to drill No. 1 Frazier and in Section 24, Haskell and others are preparing to drill No. 3 Webfer, all in the defined limits of the Stephens Pool. Keen & Woolf have set 10-inch casing at 400 feet in an interesting test on the Smart lease in Section 13-15-20, 3 miles northwest of Stephens, and a mile further northwest, Vaughn and others have made a location for No. 1 Greene in Section 11-15-20.

In Section 20-13-18, 8 miles southeast of Stephens, Miller and others are waiting for 10-inch to set at 150 feet in No. 1 Watts, and in Section 34-16-19, 8 miles further south, Murphy and others have set 8-inch casing at 1,910 feet in No. 1 Booth. The Shaffer Oil Co. has set 6-inch casing at 2,000 feet in No. 2 Atkins, Section 13-15-19, 2 miles north of Stephens in the vicinity of the old Hunter well, and is drilling at 75 feet in No. 2 Brown in the same section. Development of the Stephens Field has been carried across the line into Nevada County, where there are 10 rigs now in operation. J. L. Bullock and others are drilling at 2,060 feet in No. 1 on the Groves Land & Lumber Co.'s lease in Section 12-14-21, 8 miles west and a little north of Stephens.

Haskell and others tested salt water at 2,906 feet in No. 1 Phillips, Section 30-14-20, and are drilling deeper at 2,925 feet; No. 1 McKenzie, Section 19-14-22, is rigging up to drill. Steele & Sandlin have set 6-inch casing at 1,150 feet in No. 1 Warmack, Section 10-14-20. John Woodley and others are drilling at 1,150 feet in No. 1 Munn, Section 4-14-22, and Gierson & Davis' No. 1 Williams in Section 12-14-20, is shut down at 2,200 feet waiting orders.

Miller County.—The Magnolia Petroleum Co. is arranging to abandon its test on the Westmoreland lease in Section 9-19-27, having reached a depth of 3,832 feet without favorable results.

Nevada County.—No wells were completed in Nevada County last week, but a number of interesting tests are under way. Steele & Sandlin have set 6-inch casing at 1,150 feet in No. 1 Warmack, Section 10-14-20. John Woodley and others are drilling at 1,150 feet in No. 1 Munn, Section 4-14-22.

Fields of the Central West

By WHIT

Underwood Oil Co.'s No. 5 on L. M. Brown farm, Plain Township, Wood County, Ohio, making 105 bbls. daily. Sun Oil Co. drilled 65-bbl. producer in its No. 2 on W. S. Burns farm, in Tiffin Field. Semi-wildcat, drilled by Perry Andrews and others in Harrison Township, Knox County, Indiana, making 40 bbls. daily. Two good producers in Clark County, Illinois.

FINDLAY, Ohio,
February 26.

One of the interesting developments of the past week in the fields of the Central West was the bringing in of a 105-bbl. producer by the Underwood Oil Co. in its No. 5 on the L. M. Brown, Section 26, Plain Township, Wood County, Ohio, and north and a little west of Bowling Green in the old development. The Progress Oil Co. recently brought in a 100-bbl. producer in its No. 9 on the Case-Case farm, in the same section. In Liberty Township, Wood County, the Value Oil Co. drilled a test on the M. R. Brewer farm, Section 8, and got a 15-bbl. pumper. The Ohio Oil Co. struck salt water in its No. 15 on the Eli Stockwell farm, Section 1, near Portage, in Liberty Township, but it may yet develop into a commercial producer. The same company abandoned No. 16 D. J. Corey, Section 14, and has a rig in for No. 33 John Johnson farm, Section 11. In Montgomery Township, Wood County, the same company abandoned No. 17 Hill, Section 17, and in Freedom Township, pulled out No. 9 S. W. Owens, Section 34, No. 96 Fuhr & Villwock, same section, and No. 16 on another of the Fuhr & Villwock farms, Section 33.

In Henry Township, Wood County, the Ohio Oil Co. abandoned No. 10 Dave Fulton, Section 14. It was upon this farm that the first commercial oil well was found in Wood County, back in the '80s, shortly after the Faurot well was found at Lima, which was the starting of the development of the Trenton Rock area of northwestern Ohio. The Ohio has also abandoned in Henry Township, its No. 4 F. Bealer, Section 33; No. 35

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F. and W. Hamman, Section 21; No. 9 James Madden, Section 33, and No. 16 J. V. Davis, Section 23. Lou D. Langmade's Nos. 20 and 28 Isaac Taylor, Section 27, and No. 1 D. Bushong, Section 33, were also abandoned, and the Donald Oil & Gas Co. abandoned Nos. 7, 8 and 9 J. W. Sterling 80 acres, near Hammansburg. In Portage Township, Frank Dutcher abandoned No. 7 J. W. Knight, Section 30. Millie S. Rouse is drilling No. 21 on her own farm, Section 19. In Bloom Township, Maxwell & Harkness are drilling No. 31 R. Whitacre, Section 6, near Cygnet. In Middleton Township, Raydure, Mercer and others' No. 2 W. F. Broke, Section 20, pumped 2 bbls. The Pats Oil Co. is drilling No. 5 on the J. A. Hits farm, Section 32, Perrysburg Township, and in Center Township, the Underwood Oil Co., is drilling a test on the B. Sullivan farm, Section 28.

In Allen Township, Hancock County, C. A. Morehead is drilling No. 22 John Rowland, Section 26. Wiser Oil Co. is drilling No. 8 H. M. and M. E. Rader, Section 11, Pleasants Township In Portage Township, the Ohio Oil Co.'s No. 14 C. Drietzler, Section 27, pumped 7 bbls., and L. D. Langmade abandoned Nos. 1, 3 and 4 S. Bowman, Section 4. In Perry Township, Allen County, the Earl Oil Co.'s No. 3 Henry Hefner, Section 1, was dry. In Amanda Township, J. B. Sawmiller & Son's test on the Franklin Thomas farm, Section 23, pumped 10 bbls. In Spencer Township, the Ohio Oil Co.'s No. 11 M. Suever, Section 13, pumped 15 bbls., and this company abandoned No. 2 James O. Ward, Section 27, Bath Township. In the same township, R. Cheuvront is drilling No. 5 Collins & French, Section 32, and Carman, Botkins and others have a rig in for No. 4 Elgie Younkman, Section 2.

In Douchouquet Township, Auglaize County, the Bird Oil Co. has a 2-bbl. pumper in a second test on the Julian Meckling farm, Section 36, and is starting No. 1 on the Sycamore Brandt farm, same section. In Logan Township, the Buckland Oil Co. is drilling No. 3 S. V. Scott, Section 3. In Moulton Township, the Logan Development Co. is drilling Nos. 1 and 2 John Sutton, Section 7, and Crozier & Kelley are drilling a test on the Fred Mertz farm, Section 15. In Liberty Township, Van Wert County, Boyd & Stelzer drilled a 3-bbl. pumper in No. 4 A. Harr, Section 25. In Jennings Township, Miller Bros. & Jones abandoned No. 17 George Becker, Section 5, and John Mueller is drilling a second test on his own farm, Section 6.

Tiffin Field Producer

The Sun Oil Co. drilled a good producer in the Tffin Field in No. 2 on the W. S. Burns, Section 16, Eden Township, Seneca County, the well doing 65 bbls. Top of Trenton was found at 1,689 feet and drilled 170 feet in to a total depth of 1,859 feet. The same company is drilling No. 15 J. C. Yarger, Section 9, and in Pleasants Township, same county, the Sun Oil Co. is drilling No. 8 Frank Shannon, Section 33. In Hopewell Township, E. R. Edson & Son are drilling a test on the W. H. McCleve, Section 13, also a test in Clinton Township, on the Fred Bock, Section 21.

In Harris Township, Ottawa County, the Harris Oil Co.'s second test on the Ed Dietermyer, Section 23, pumped 18 bbls. There are 10 strings of tools working in the Darke County field, in Mississinewa and Allen Townships, and as soon as weather conditions improve many more will be started. In Mississinewa Township, E. G. Henderson and others' Nos. 1, 2 and 3 J. Miller, Section 2, pumped 25, 40 and 45 bbls. respectively. In Allen Township, John King and others drilled a 5-bbl. pumper in a test on the Zacharious, Section 20. Hance Bros. are drilling No. 1 J. B. Walls, Section 7, and No. 5 on the George Gerlock, same section.

The drilling tests in Mississinewa Township, Darke County, are working to the southwest of the good wells of the Cole Oil & Gas Co. Zartman & Green are working on a test on the J. B. Walls, Section 14 and Wenthorp & Mondell are drilling No. 5 F. Seifring, Section 2, and Green and others are drilling a test on the C. T. Ritenour, Section 10. In Section 14, Estes & Eggert are drilling No. 1 J. E. Poenter; Mack P. Colt is drilling No. 2 C. R. Stechelman farm; Pyramid Oil Co. is drilling No. 1 Jacob Miller. Clark and others drilling No. 1 W. S. Bowers, and George Peffers is drilling No. 1 Kenney, all in Section 14.

Indiana Field

The most interesting find reported from Indiana for the week was developed in the territory between Terre Haute and Vincennes, in the southwestern part of the State. It is a semi-wildcat, being located some distance in advance of production, and was drilled by Perry Andrews and others on the Ida B. Doty, Section 29, Harrison Township, Knox County. It showed a production of 40 bbls. at a depth of 1,860 feet. In Gill Township, Sullivan County, Hawkins & Bailey are drilling a test on the A. and J. Graham, Section 12, and Billman and others are working on a test on the W. W. Higdon, Section 3, Hamilton Township.

In the old Trenton Rock section of Indiana, the best of the late completions is a 60-bbl. pumper developed by George P. Mertz in a second test on the Dave Michaels, Section 15, Delaware Township, Delaware County. In Niles Township, W. S. Estill drilled a dry hole in a test on the P. W. Vincent, Section 27. In Salamonie Township, Huntington County, A. E. Harper's No. 6 Dr. Bonifield, Section 19, pumped 10 bbls. In Penn Township, Jay County, the Heeter Oil Co.'s test on the Chas. Grissell, Section 13, is a duster, as is the Amber Oil Producing Co.'s No. 11 James Sutton, Section 21. This company is drilling No. 10 S. E. Davis, same section. In Bear Creek Township, Jay County, the Shamrock Oil Co.'s No. 6 Ada M. Miller, Section 2, pumped 20 bbls. There are but 5 strings of drilling tools reported in Jay County. In Liberty Township, Wells County, Say and others are drilling a test on the H. Fudge, Section 30.

The two important finds of the week in the old Illinois Field were made in the new stray sand being developed near Martinsville, in Martinsville Township, Clark County. William Ryan and others brought in the two wells in No. 11 George W. Carper, Section 30, with 75 bbls. at 1,398 feet, and No. 12 on same farm, for 50 bbls. at 1,399 feet. This is the most active section of Clark County at this time. In Oblong Township, Crawford County, the Ohio & Northern Oil Co.'s No. 15 on the Sam Dennis, Section 29, pumped 12 bbls. at a depth of 985 feet. McDowell Bros. are drilling No. 4 Mary Bruner, Section 12.

In the Centralia Field in Marion County, Ewing Marquis and others' No. 5 August Rohl, Section 19, pumped 50 bbls. at 762 feet, while F. A. Johnson and others' test on the J. N. Orthous, Section 8, is a duster at 987 feet. Two of the outside prospective pools recorded dry holes during the past week, one on the east side of the State and the other on the west side. In Bradley Township, Jackson County, in the western section of the State, the Mid-Egypt Oil & Gas Co. drilled a dry hole in No. 5 on the Ditch farm, Section 12. The other failure is in Wabash Township, Wabash County, and on the eastern side of the State, where Kearns and others drilled a dry hole in a test on the J. L. Sandlin farm, Section 17, and south of the good wells recently drilled in the new territory near Allendale.

Eastern Kentucky

Few completions are reported from the eastern Kentucky fields during the week, due to weather conditions. In the old Lee County Field, but one completion is reported for the week, it being the Superior Oil Corporation's No. 14 J. D. Smythe, with 6 bbls. In Wayne County, the Wood Oil Co.'s No. 1 Jones, and Marsh and others' No. 1 Duffy, were both dry holes. In the Hueyeville District, Floyd County, the Carter Oil Co.'s No. 3 Lena Hall, is reported at 3 bbls.

Three completions are reported from the Johnson-Magoffin County area, all owned by the Union Gas & Oil Co. No. 10 George Kelley No. 1 farm, is good for 50 bbls. and No. 8 J. M. Fyffe farm showed 60 bbls., while No. 1 L. T Skaggs showed 6 bbls.

In Cumberland County, the Southern Oil & Refining Co. is making preparations for the shooting of its No. 1 on the T. M. Glidwell farm, on Brush Creek where a fair showing was encountered in the first Sunnybrook sand. The Vansickle Oil Co. found a fairly good showing in the second Sunnybrook sand in No. 1 on the Parrish farm. The Atlantic Oil Producers Co. has started drilling its No. 1 Bow farm at Neeley's Ferry. This test is an offset to the Paragon Development Co.'s No. 1 on the George Capps farm. The McClintock Oil Co. is reported rigging up to pump its No. 5 on the J. R. Neeley farm, at Neeley's Ferry. It was reported a dry hole, but may yet develop into a commercial producer.

The McClintock Co. is installing a power pumping plant on its Smith farm lease on Bear Creek. This lease is reported doing around 50 bbls. a day with No. 6 ready to start drilling. This company and W. S. Raydure have their No. 3 on the J. F. Anderson farm, on Kettle Creek, about due for completion. The Paragon Development Co.'s No. 2 George Capps farm, at Neeley's Ferry is due for completion, as is the Daniel Boone Oil Co.'s No. 1 H. Skipworth farm. The Associated Producers' No. 4 G. W. Coop farm, in the Sulphur Creek district, struck a crevice and skidded the rig and started a new hole. The Southern Kentucky Oil Co. is due in with its test on the Crawford farm. W. S. Raydure and others are also due in with No. 2 Blythe farm. The next week or so should see close to half a dozen completions in the Cumberland-Monroe area.

There has been much talk of pipe line construction from the Kettle Creek Field in Monroe County. It was understood that prospects of an extension from the Sulphur Creek line to the Kettle Creek Field was contemplated, and then came a report that other interests talked of putting in a line from Kettle Creek to Glasgow, but as yet work has not started on either project. Recently a couple of representatives of the Cumberland Pipe Line Co. were looking over the conditions in Cumberland and Monroe Counties and the results of their visit has not as yet been announced.

The runs of the Cumberland Pipe Line Co., through its gathering lines in the eastern Kentucky fields for the week amounted to a total of 77,741.71 bbls. for a daily average of 12,953.61 bbls.

Pennsylvania-West Virginia

By D. S. WAKENIGHT

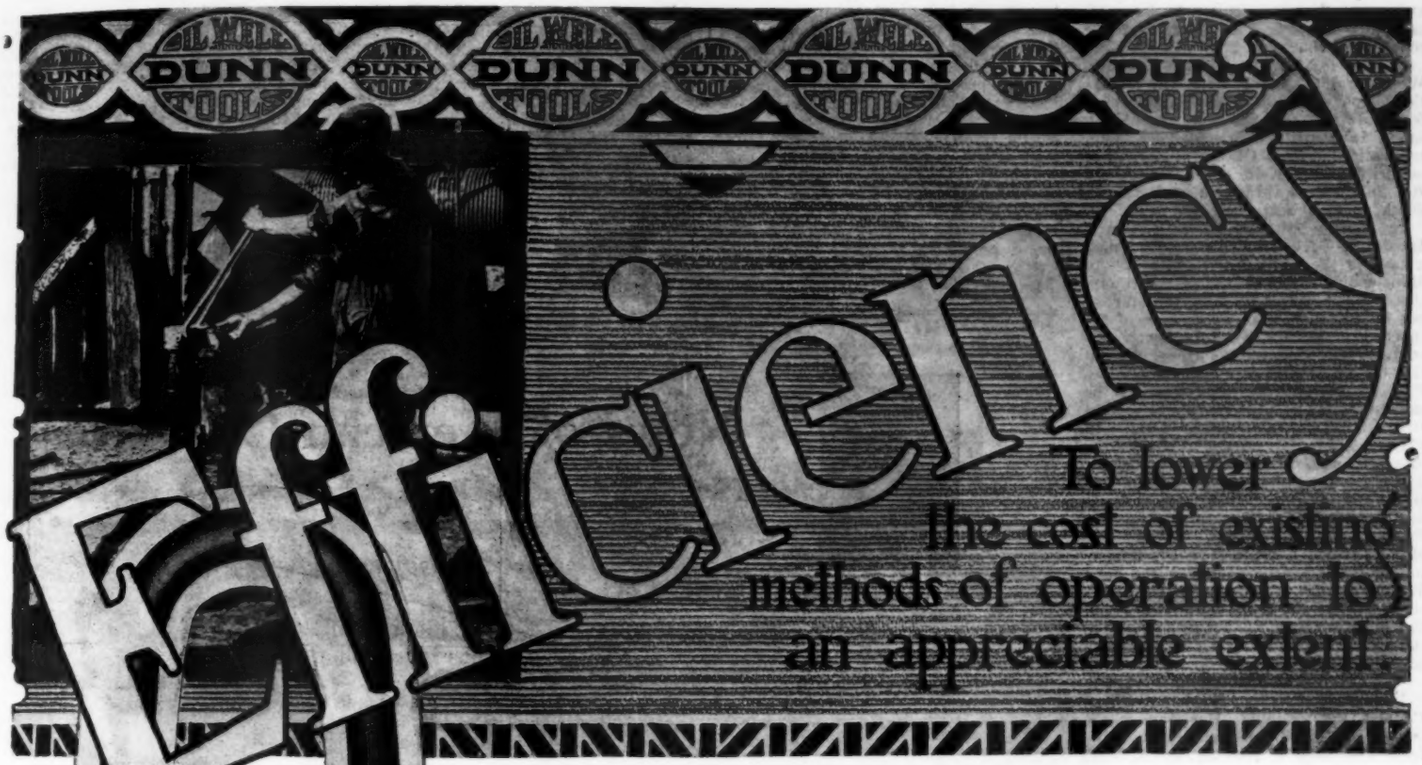
Cline & Vensel's test on Breen-Schultz farm, Ward Township, Hocking County, Ohio, in advance of production came in as good producer. Thomas Walker & Co. brought in a 25-bbl. producer in Colerain Township, Belmont County, Ohio. Best completion in West Virginia was 15-bbl. pumper. Light pumpers were best southwestern Pennsylvania could do.

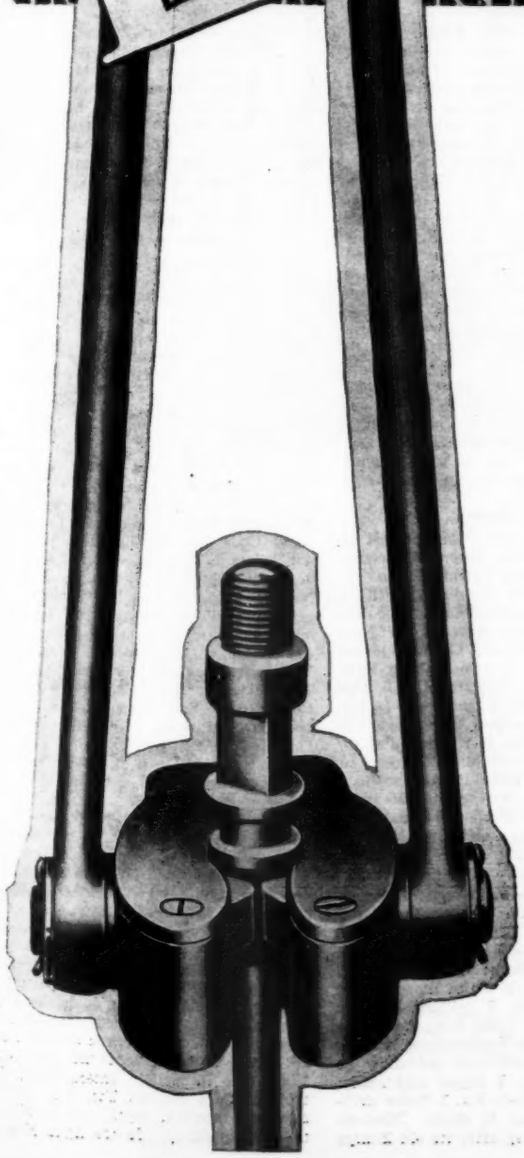
PITTSBURGH, Pa., Feb. 26.

The cold weather that prevailed throughout the East during the past week brought field work well nigh to a standstill and there were very few completions and very little work started. In the list of completions there was only one with an initial production of more than 25 bbls. The deep sand territory in southeastern Ohio came to the front with a good producer. The well is located in Section 16, Carbon Hill district, Ward Township, Hocking County. It is Cline & Vensel's test on the Green-Schultz farm, located 1½ miles east of the Chartiers Oil Co.'s No. 154 on the Hocking Valley Products Co.'s property. It is located far enough in advance of production to make room for and call out some new work in that locality. Other completions in the deep territory consisted of light pumpers and dry holes. In Colerain Township, Belmont County, Thomas Walker & Co. got a 25-bbl. producer when they drilled a test on the Kowalzky farm through the Berea grit.

The West Virginia fields made a disparaging showing during the week. Out of a score and a half of completions the best was a 15-bbl. pumper. Several important wildcats were completed in the lower southwest fields, but none found oil in paying quantities. In the same section, there is some scouting for leases with a view to testing out some large blocks in the early spring. Nearly all of the new work starting at this time is located in the old producing districts, some of which have not completed a well in several years. Drilling wells from an exhausted producing formation to a lower sand is the practice and no matter how small the show of oil the well is not abandoned until it has been shot and tested and proven worthless.

The southwest Pennsylvania fields had very few completions and none better than light pumpers. Of the four counties, Greene is the most active and the best prospect for new production. This county has not been so closely drilled over as Allegheny, Washington or Beaver. At the present time it has more work





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under way than any other. As for wildcat work there is none in any of the counties named.

In Proctor district, Wetzel County, West Virginia, the Proctor Oil & Gas Co. completed a test on the Baxter heirs' farm. It is a fair gasser in the Maxon sand. In Glenville district, Gilmer County, the Philadelphia Oil Co. drilled a test on the Jefferson Keith farm through the Big Injun sand. It is a gasser at a depth of 1,850 feet.

In Union district, Tyler County, Horner & Parker have started to drill a test on the Lemuel Parker farm. In Monongalia, Marion and Wetzel Counties, a number of tests had been started, but all are shut down on account of the shortage of gas for fuel. In Center district, Wetzel County, the Hope Natural Gas Co. has started a test on the Charles Pyles farm. In the same district, the same company is moving tools to a location on the A. M. Muffany farm. In Clay district, Monongalia County, the Randall Gas Co. is placing rig timbers at a location on the Lucy Stull farm. In Grant district, the same company is starting to drill on the J. N. Eddy farm. In Proctor district, Wetzel County, the Manufacturers Light & Heat Co. is moving in tools to drill a test on the John W. Moore farm. In Grant district, after standing idle for more than two years, the Southern Oil Co. has gone back to the rig on the A. F. Engelhart farm and started to drill.

Southwest Pennsylvania

In the Duff City Field, Allegheny County, Pennsylvania, Harbison & Co. completed No. 3 on the Pegher heirs' farm and have a showing for a 5-bbl. pumper in the 30-foot sand. In Hanover Township, Beaver County, Mellon & Galey have a very light pumper at a second test on the Dwight Cain farm. On Wagon Road Run, Springhill Township, Greene County, the Pierson Oil & Gas Co.'s second test on the W. H. Pierson farm is a 12-bbl. pumper in the Gordon sand. In Gilmore Township, the Manufacturers Light & Heat Co. has completed No. 3 on the P. Aiken farm. It is a fair gasser at a total depth of 3,140 feet.

Near Ligonier, Westmoreland County, located on Chestnut Ridge, the Peoples Natural Gas Co. has now reached a total depth of 6,865 feet at its deep test on the Seger Brothers' farm and drilling in a dark slate formation. In the same locality, the same company is down 6,305 feet at a second test on the Booth & Flinn property. This well must go to a depth of 6,822 feet before reaching the sand in which the first well got its gas.

Southeastern Ohio

Near New Lexington in the northeast quarter of Section 14, Jackson Township, Perry County, the Southern Oil Co. has completed No. 7 on the Charles E. Finck farm. It is showing for a light producer. For more than a year the Southern Oil Co. has been completing some good producers on this farm. In the shallow territory, Section 27, Pleasant Township, S. H. Penrod & Co. have a light pumper in the Berea grit at a second test on the Joseph Alton farm.

In the Marietta district, Warren Township, Washington County, Vinnie Childers & Co. have completed No. 15 on the Edward Anderson farm. It is dry in the Cow Run sand. In the same township, M. E. Taggart & Co.'s second test on the Maynard Martin farm is dry in the Big Injun sand and is drilling to the Berea grit. In Lawrence Township, Floyd Lane & Co. have started to drill a test on the Harvey McKain farm. In Dunham Township, the Central National Bank's test on the Lindsay Dearth farm is a duster.

Columbiana County, Ohio

The new shallow sand pool in Columbiana County, Ohio, is attracting the attention of oil men in southwestern Pennsylvania and eastern Ohio. There are eight drilling machines (all the wells are put down with drilling machines) at work in the pool and more moving in. Thomas Hiland has just drilled in a producer on the Butler farm and will move to a location east of the producer. He has a daily production of 125 bbls. and a number of undrilled locations on his properties. On the Smith farm, the Allied Oil Co. has completed No. 13 on the Smith farm, a good producer. This company has a daily production of 75 bbls. It has three producing wells on the Lipp farm.

Core & Co. brought in a nice producer on the Trotter farm at a depth of 483 feet. Two pays were found in this well. The upper pay was found to be 10 feet in thickness and the lower 5 feet. They will give it a shot and put it to pumping. E. E. Tirk and associates are drilling on the Semple farm. This is their fourth well on this farm. They have 10 or 12 more locations to drill.

The Wisconsin Oil & Gas Co. has moved in two new drilling machines on the Weaver-Roller lease, on which they have at the present time a production of about 60 bbls. a day. They also have two producers on the Leslie Millinger farm, adjoining the Roller lease. Steubenville, Ohio, parties have opened negotiations to take over a block of leases just south of the old well drilled by the Devonian Oil Co. With the transaction closed, the owners will start development work at once.

In the same locality, L. A. Hoffman will begin operations on his holdings as soon as the weather conditions are favorable. Welch & Co. are drilling a test just north of the corporate limits of Columbiana. They hold leases on 1,000 acres, on which they will drill several test wells. The oil is of 52 gravity and commands a premium of 10 cents a barrel over the Pennsylvania grade. It is expected that the coming spring and summer will witness great activity in the pool. With a good drilling machine it requires but two weeks to start and complete a well. Being shallow territory, almost any number of wells can be hooked up to a central power plant, entailing very little expense to operate the wells after connected.

News of Mexican Oil Fields

By GEORGE BLARDONE

Transcontinental Petroleum Co.'s No. 9, Lot 4, in Cacalilao sector of Panuco Field came in good for 5,000 bbls. La Corona Petroleum Co.'s No. 8, in same lot, good for 2,000 bbls. Mexican Petroleum Co.'s No. 23 La Dicha, in Ebano Pool, has a 1,000-bbl. producer at 1,885 feet. No completions reported from South Fields. Rains hold up development work.

TAMPICO, Mex., Feb. 23.

Panuco and Ebano carried off the honors the past week in so far as completions were concerned. In the Cacalilao sector of the Panuco Field, Transcontinental Petroleum Co. scored with the best completion of the week, its No. 9 there, in Lot 4, coming in good for 5,000 bbls. at 1,620 feet, a shallow well. La Corona Petroleum Co.'s No. 10, in the same lot, was a comparative failure, being good for only 75 bbls. at 2,239 feet, but its No. 8, in the same lot, is good for 2,000 bbls. at 1,740 feet. International Petroleum Co. in its Nacata lease, which is west of Cacalilao, and southeast of Ebano, has a failure in No. 13, which is a duster at 3,002 feet (Tamasopa limestone). In the older areas of the Panuco Pool, Cochrane and others have a 300-bbl. well in Lot 12 Isleta at 2,125 feet, and Panuco Boston Oil Co.'s No. 15 Ugarte, is good for 1,000 bbls. at 1,915 feet.

In the Ebano Pool, Mexican Petroleum Co., in No. 23 La Dicha, has a 1,000-bbl. producer at 1,855 feet, its best well since it resumed drilling in this, the first commercial pool of Mexico, in 1921. There were no completions in the South Fields in the past few days.

At Cacalilao

Owing to hard rains the past few days throughout the fields, not much progress will be made in many of the wells in the Cacalilao sector of the Panuco, especially in Lot 1, which is interesting to so many of the smaller independents. Rich Mex Oil Co.'s No. 1, in Lot 1, fraction 4-B, has made practically no progress since it was last reported as showing at 1,948 feet. No. 2 in same section, is drilling around 1,980 feet and doubts are being expressed as to whether it will ever prove a commercial producer or not. There are no changes in the other Rich Mex locations and drilling tests since the last report.

Mexican Sinclair Petroleum Corporation's No. 1, Lot 2, Cacalilao, is drilling at 2,128 feet with a continuation of its head shows. Its other tests in Lot 3 are shut down owing to some legal complications. The Empire Gas & Fuel Co.'s tests in Cacalilao are drilling as follows: No. 1, Lot 3, in the Tamasopa at 2,005 feet, showing around 500 and 600 bbls.; its No. 4 and 8, same lot, cementing 8-inch at 1,176 feet and 1,225 feet respectively in the San Felipe formation; its No. 7, continues shut down at a nominal depth on account of no water. Cia. Pet. Cosmos (Alonzo-Anderson and others), are clearing location for No. 1, Lot 1 (fraction 2-B), and have locations made for Nos 12, 14, 15 and 16, in the same lot and same fractions. International Petroleum Co.'s No. 17, Lot 5, is spudding. Mexican Atlas Petroleum Co.'s No. 1, Lot 1, Cacalilao, (fraction 2-B), has a fishing job at 1,970 feet, but it is making head flows every 7 hours at say 250 bbls. Mexican Gulf Oil Co.'s No. 1, Lot 1, (2-B), has a derrick up. Mulcahey and others' No. 1, Lot 1, (2-B), is drilling around 1,000 feet in shale and shell. Vera Cruz Mexican Oil Syndicate's No. 1, Lot 1, Cacalilao, (1-A) has cemented 8-inch at 1,200 feet in shale. Transcontinental Petroleum Co.'s No. 16, Lot 4, is drilling in shale at a nominal depth; its No. 17 is cementing 8-inch at 1,420 feet, in a limestone; its No. 18 is moving in, and No. 19 is rigging.

Older Panuco

In the older Panuco Pool, interest is centering around the Tamante sector, Lot 9, where Credito Petroleum Co. recently brought in an interesting well of 2,000 bbls. Credito itself is getting derricks up there in the same lot for Nos. 2 and 3. East Coast Oil Co., that owns some offset leases, is also making locations, and Mexican Gulf Oil Co. is rigging for its No. 2 Cruz-Tamante. In the Potrero del Ojital sector, La Corona Petroleum Co.'s No. 45 is rigging, and its No. 47 is drilling in shale at 275 feet. In the Tanchicuin, Credito Petroleum Co.'s No. 16, Lot 7, is moving in. Mexican Sinclair Petroleum Corporation's No. 4, Lot 12, is spudding; and Cia. Mex. de Placeres' No. 6, Lot 12, is drilling in shale at 950 feet.

The other companies' operations in Panuco follow: La Credito Petroleum Co.'s No. 9, Lot 5 Lomas y Llanos, (the old well), is drilling a gray limestone at 2,161 feet; East Coast Oil Co.'s No. 6 Halcon, drilling in a white limestone at 2,475 feet; its No. 7 drilling in gray shale and shell at 1,658 feet; La Espuela Oil Co.'s No. 6 Perforadores drilling in lime with an oil and gas show at 1,893 feet; its No. 7 rigged and ready, and English Oil Co.'s No. 1 Noles drilling around 700 feet in shale. Mexican Gulf Oil Co. is going after its old Zuniga lease again with No. 7, which is moving in. Mexican Sinclair Petroleum Corporation is also going to tackle one of its old productive leases with No. 7 Gonzales, to which it also is moving material. New England Fuel Oil Co.'s No. 3 Salvasuchi, is drilling in shale at 525 feet, and its No. 9 San Manuel, has cemented 10-inch in shale at 935 feet. The Texas Co. in the old Chotes lease, No. 4, is drilling in gray shale at 1,385 feet.

In the South Fields

In the South Fields, also hampered now by heavy rains, Huasteca Petroleum Co.'s (Mexican Petroleum) No. 2-A Juan Felipe, is running 8-inch at 1,615 feet in blue shale; No. 3-A drilling in brown shale at 540 feet; No. 4-A drilling in blue shale at 550 feet; No. 5 continues swedging 10-inch at 909 feet; No. 6 fishing in gray shale at 2,645 feet; No. 7 drilling at 234 feet in blue shale; No. 8 drilling in a similar formation at 1,848 feet; No. 9 spudding and No. 10 is a derrick. Up in Chiconcillo, Tom Allen is drilling around 425 feet in shale in Lot 2. In Tepexinta, Agwi Co.'s No. 16, Lot 247, is drilled 4,060 feet in the Chicontepec, and shut down to install heavier machinery; its No. 18, Lot 176 Amatlan, is drilling in gray and blue shale at 1,807 feet, and on its drilling agreement with the Mexican Eagle Oil Co., to drill Tamhiahua lagoon, it is moving in equipment for No. 1 Tamiahua. La Corona Petroleum Co.'s No. 1 San Javier, is over 4,000 feet now, in shale, and running 6-inch. Over in the Percero, its No. 1 is reaming to carry 10-inch to 3,382 feet, the depth of the hole which is in shale. In the Amatlan, its No. 35, Lot 224, is drilling in limestone at 1,938 feet.

Cortez Oil Corporation, in the Aguada, has cemented 10-inch at 2,765 feet, and is drilling now at 2,775 in the Chicontepec formation. Its No. 4 is rigging a rotary at 1,175 feet, in gray shale. Cia. Pet. Cosmos' No. 2, Lot 16, Zacamixtle, has fished out drill stem and is ready to resume at 2,245 feet, San Felipe. Gilliam & Nelson's No. 11, Lot 206 Amatlan, (Transcontinental lease), is driling plugs to resume from 1,053 feet, where 10-inch was cemented. Lindberg & Sandoval No. 25, Lot 2, Chinconcillo, is drilling around 1,000 feet in shale. International Petroleum Co.'s No. 26 Toteco is drilling now at a nominal depth, and its No. 27 there is spudding. In the Agua Nacida,

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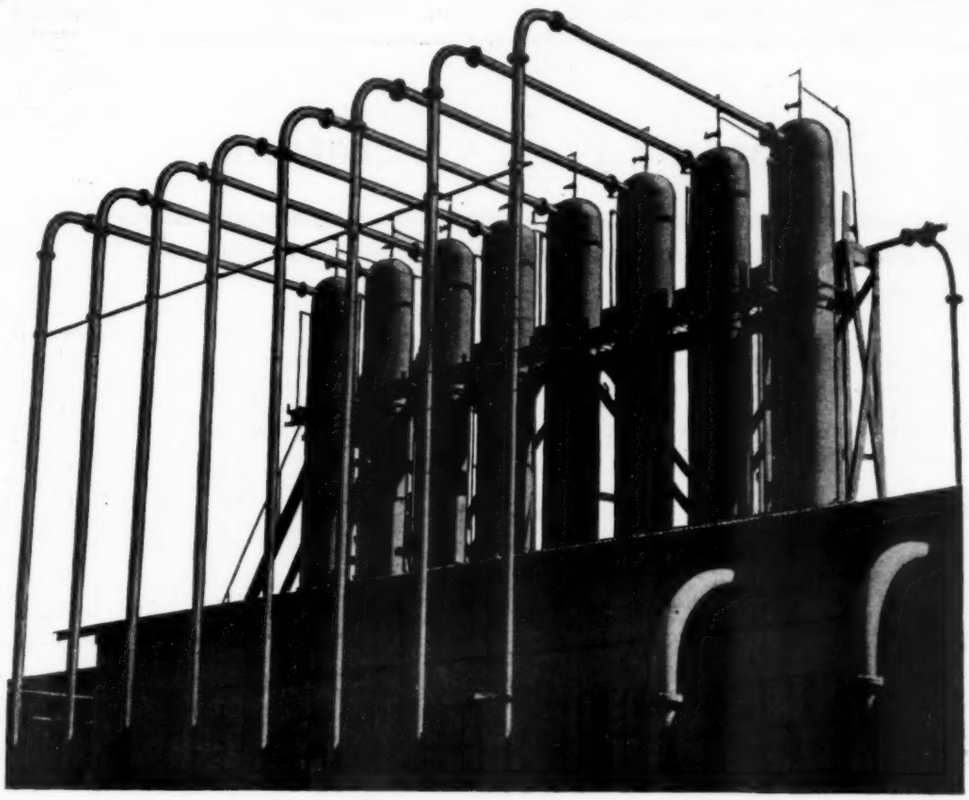

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International is underreaming at 3,105 feet; its No. 5 has fished out lost swedge at 820 feet; its No. 6 is drilling at 2,130 feet in gray shale, and its No. 7 is drilling at 2,280 feet in shale. Over in the San Miguel, east of Alamo, it is drilling in blue shale at 630 feet. Up in Cincuenata, east of Tepetate, it has set 12½-inch at 1,460 feet, and is drilling now in gray shale at 1,480 feet.

Mexican Eagle Oil Co.'s No. 13 San Geronimo, is drilling at 998 feet, in blue shale; its No. 23 Alazan is drilling at 2,012 feet in shale, and it is rigging up for Nos. 17 and 18 Cerro Veijo. The status of its other active tests remains unchanged since the last report. Mexican-Sinclair Petroleum Corporation's No. 2 San Miguel, is drilling in shale at 1,200 feet.

Topila and Miscellaneous

When the Texas Co. completed its shallow producer in Lot 35, Paciencia de Agaucate sector of the Topila Field, it caused a buzzing there. Not only is The Texas Co. in there now with four strings going, but there are a number of others who are getting in also, notably Tavez Oil Co. on its leases and Cia. Pet. Cosmos, which is moving in on Lot 30. The Texas Co., with tests already drilling, will have in the next wells. Its No. 2, in Lot 50, is drilling now in the brown lime at 2,242 feet, with some gas showings. Its No. 3, Lot 35, is rigging standard tools to drill in from 1,618 feet, where it cemented 8-inch in a shell; its No. 4, in Lot 29, is drilling at a nominal depth, and No. 2, in Lot 38, is drilling in blue shale and gumbo at 1,465 feet. Cia. Pet. Financiera's No. 7, Lot 5, is drilling at 525 feet in shale. Mexican-Sinclair Petroleum Corporation's No. 1, Loma del Pozo, is drilling at 2,878 feet in a green shale.

In the Marland Field, Cia Pet. Franco Espanola's No. 10 Limon, has shut down for orders at 3,005 feet, which will probably mean the abandonment of the hole. At El Barco, Kern Mex Oil Fields' No. 4 La Palma, is drilling in gray shale at 1,215 feet. Mexican Gulf Oil Co., in the same sector, No. 2 El Barco, is drilling in gray limestone at 2,179 feet; and its No. 9 is drilling in a broken limestone at 1,315 feet; and its No. 11 is rigging. Cia. Mexicana de Pet. Placeres' No. 3 has cemented 8-inch around 1,709 feet in a shell.

At Coucite, Island Oil & Transport Corporation's No. 1 is drilling at 4,805 feet in a shale, with some gas showing. All gas shows will be tested and the hole bailed to see if any production has been mudded off by the rotary. It will be recalled that this test is some 45 miles southwest of the city of Vera Cruz and, it is today, the deepest oil well ever drilled in Mexico.

Wyoming Field Operations

By F. B. TAYLOR

Two wells drilled to second Wall Creek sand on Teapot Dome by Mammoth Oil Co., where good oil production was expected are flowing water. Belief gaining strength, however, there may be a producing horizon under second Wall Creek. Mid-Northern Oil Co. brought in well estimated good for 300 bbls. in Section 9-35-2w in Montana.

CASPER, Wyo., Feb. 23.

Two water wells were drilled in on Teapot Dome last week in places where good oil production was confidently expected, causing somewhat of a sensation among operators in this district. One of the wells, located on Section 14-38-79, was 15 feet in the second Wall Creek sand and making water fast, and the well on the south line of Section 27-39-78 was also in the same sand and showing water and no oil. Both wells are being drilled by the Mammoth Oil Co.

This would appear to show that the Teapot structure is to be found much smaller in productive area than was at first thought or even expected by the geologists and oil men. The outer edges of the field were thought to lie well outside the escarpment and those two water wells are located over a mile inside the escarpment rim. The two wells practically condemn territory outside the withdrawal and unless fault planes shut off the water much of the land now held by the Mammoth Oil Co. is said to be worthless.

The Enos Creek test being drilled on the structure of the same name by the Producers & Refiners Corporation in Warm Springs County, west of the Grass Creek Field, is attracting considerable attention. This wildcat location is on a well defined structure, according to reports from scouts, and the opinion is that the Producers & Refiners Corporation will bring in a new field there. The test is down about 2,250 feet now and the sands are expected at about 3,000 feet.

Shipping Crude Regularly

The Producers & Refiners Corporation is shipping crude regularly from the Ferris Field in Carbon County through the new pipe line that connects the Lost Soldier district with Parco. Parco is the new name for Grenville, the point on the Union Pacific Railroad where the Producers & Refiners Corporation put up the refinery. At present the pipe line is being powered by steam pumps, but when the installation of the regular pumping stations is completed the pumps will be powered by oil engines of the semi-Deisel type, taking their fuel from the line direct. In spite of the cold weather, the line has been working perfectly and shipments of crude are being made daily.

With the completion of the refinery at Parco, the Producers & Refiners Corporation will be the strongest independent concern in this region. The firm now owns and operates the largest system of gas lines in the Rocky Mountain fields, furnishing gas to Riverton, Lander, the Casper refineries and many intermediate points. It also has two large gasoline plants in operation and production in nearly every field of prominence.

East of the town of Glenrock, the Sinclair pipe line tank farm is a scene of activity. Six 80,000-bbl. tanks are in the course of erection and many more sites are being graded, with cars of steel coming in daily to add to the piles of tank plates piled about the farm. The survey for the line is finished and the engineers of the survey of this district met the engineers from the southern end near Keystone, Neb., and connected the two surveys.

The Union Oil Co. of California is preparing to start a deep test near Waverley, Colo., a few miles out of Fort Collins. It is to be drilled about a mile in depth and will be one of the deepest wells in Colorado when completed. Five tests are to be started on the Hoback structure in New Mexico in the near future by the Midwest Refining Co. and The Texas Co. is also to start a deep test in southern Colorado shortly.

At Billy Creek, in Johnson County, where the Consolidated Royalty and the Carter Oil Co. drilled in the big gasser a short time ago, preparations are under way to drill two more tests at once and several other locations are staked out to continue the development of the structure. This dome so far has shown only gas, but the gas is very wet with gasoline and will make the operation a profitable one even if the structure does not prove oil bearing with further development.

Montana

Due to a shut down, the pipe line of the Illinois Pipe Line Co. between Sunburst and Coutts, Canada, is frozen and no oil is being shipped. The storage at Coutts proved defective when the line started to pump oil and the tanks were found to require considerable repairing before they would the crude. The storage of one 37,500-bbl. and smaller tanks at the Sunburst tank farm were already filled in anticipation of the opening of the line to Coutts and as there was no outlet for the crude the Illinois was compelled to shut down its gathering system in the Sunburst Field because there was no place to put the crude.

The pipe line company tried to obtain tank cars to relieve the situation, but was unable to do so in sufficient numbers to have any effect on the stored oil and as a result, the whole operation was shut down for a few days. A few wells that happened to have some empty tanks on hand were pumping, but the main field production was shut down.

The thermometer registered 40 below zero in the Sunburst Field the past two weeks and this has stopped many of the drilling wells by freezing water supply lines and also making the fuel oil so thick that it would not run. At present, the field is experiencing warmer weather and the trouble is expected to soon pass.

The Mid-Northern Oil Co. drilled in a good well on the Swears lease on Section 9-35-2w. The Ellis sand was found at 1,666 feet and the well made a flow and then bridged. As there was no storage available, no test of production was made but the well is estimated as good for 300 bbls.

Charles Lackey, operating in the Big Piney district in southwestern Wyoming, has placed a still in the Big Piney Field and is making runs of the crude there The product is marketed locally as fuel oil and gasoline. This field is a shale oil operation and produces some of the highest grade crude in this region.

May Be Deeper Sand

The drilling in of two water wells in the Teapot Dome at first threw a cloud over the prospects of a large field, and those interested in the Teapot Dome lands outside of the Mammoth holdings were somewhat dismayed over the prospect. Now, however, public opinion seems to have taken a rebound and the geologists are being questioned closely regarding the Dakota formations in that field.

When the Shannon Pool was drilled back in the early days, the are of that pool covered about one section of land or a square mile. When the first sand at Salt Creek was found to be oil bearing, the field jumped from 1 to 6 or more square miles in productive area and when the second Wall Creek was drilled into and found productive, the area was enlarged to its present extent of approximately 15 square miles.

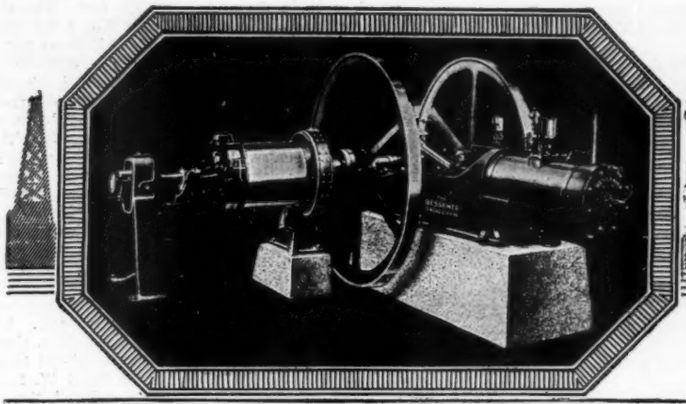
Geologists have always held that a third possible oil horizon lies under the second Wall Creek sand in the Cloverley formation, commonly known as the Dakota and Lakota sands, and the operators of the Teapot area are now pinning their faith to this sand and hoping it will prove to be the main oil horizon of the field as the first Wall Creek was to Salt Creek. The second Wall Creek sand in Teapot is showing up for a small area like the first Wall Creek sand did at Salt Creek and, therefore, the holders of tracts about the outer edge of the field are inclined to the belief that a still lower horizon exists where the main production will be found.

No wells have ever been drilled to this lower formation in the Teapot and it is expected that it will be found at an average depth around 3,500 feet. Such wells would cost heavily and unless the production was large, it would not be a commercial undertaking to develp the field. The Midwest Refining Co. drilled one well to the Dakota in the central part of the Salt Creek Field and this is the only well ever reaching that sand. It found the pay at 2,613 feet and, according to reports, the well is producing between 300 and 400 bbls. daily. The well has been drilled about 2 years now and, owing to a defective string of pipe, the hole is troubled with water found in one of the upper sands.

WILDCAT ACREAGE CLOSE TO TONKAWA FIELD SELLS GOOOD

The growth of the Tonkawa Field of Oklahoma is held responsible for an important wildcat acreage deal. The Alcorn Oil Co. (Marland interests), purchased and took over the drilling test of the Besdor Oil Co., in SW cor. SE, Section 9-25-2w. Several hundred acres of leases in Township 25-2w were included in the deal, which involved approximately $150,000 cash. Interest in this test, which is about 10 miles northwest of the Tonkawa Field, was increased recently by a showing of gas in sand at 665-88 feet. A depth of 930 feet had been reached last Monday.

Purchase of a one-half interest in approximately 1,640 acres in the vicinity of the test, held by George Failing of Garber, Okla., by the Carter Oil Co., has attracted attention of oil men toward this wildcat. Failing's holdings were scattered, but were all in Township 25-2w. The consideration in this deal was about $150,000. The purchase of acreage near this test indicates that favorable wildcat territory in the northern part of Oklahoma will get increasing attention during the remainder of the present year.



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BESSEMER OIL FIELD ENGINES—COMPRESSORS VACUUM PUMPS—ROLLER PUMPING POWERS

It is a noticeable fact that every time a deeper sand was discovered, the output and area of the Salt Creek Field was increased more than double the previous output and area. If the Teapot area is similar, the Dakota sand will extend the Teapot area out beyond the escarpment.

The Illinois Pipe Line Co. has commenced work on the pipe line from Bucknum to Salt Creek and the line has been surveyed and the ditchers are now at work.

The Ohio Oil Co. finished its test on Section 12-39-79 in the Salt Creek Field and has an average producer in the second Wall Creek sand at 2,380 feet. The same company has a shale well at Rock River on Section 21-9-78 that is making 15 bbls. daily from about 400 feet and drilling has been stopped temporarily until the production is exhausted. The Ohio is also drilling two tests on Section 3-19-78 at Rock River. One hole is at 3,180 feet and the other is spudding. The Trapshooter lease test on Section 34-20-78 is running tubing at 3,567 feet to pump and the test on the University tract, Section 26-20-78, is fishing for casing. The same firm has spudded in and shut down on Section 24-20-78.

The Ohio is also drilling two tests at Lance Creek and one at Mule Creek. The well at Baxter Basin has passed through the gas sand and is drilling at 2,510 feet. A fishing job is in progress at Oregon Basin and also at Hidden Dome, and at the second hole on the Mercer Dome the crew is runing the 10-inch casing at 1,770 feet.

The Rocky Mountain Oil & Gas Producers' Association will hold a meeting at the Henning Hotel in Casper, March 7 to consider plans for the drilling of wells in the Salt Creek Field.

The Burns Oil & Development Co., a new incorporation, is preparing to start work in the Brenning Basin Field in Converse County, Wyoming. The firm has secured title to 640 acres in the field and this area is shallow drilling, wells being put down to the pay in about a week's time. The Brenning Pool is one that has been known since the early days of the oil industry in Wyoming, and the early operators were disappointed in the quantity of production, the largest well in the field making only about 100 bbls. Uusually the wells drop to about 5 bbls. shortly after being drilled in. A pipe line connects the field with the railroad and a small refinery was built a few years ago at Fort Fettermen, where the pipe line ends at the railroad. The pipe line, however, has never been tested and will require repairs to place it in shape to run the oil. At the present market for Wyoming crude, the smaller fields are receiving considerable attention and with efficient methods the Brenning Basin should produce oil at a profit.

Pipe Line Runs

	Bbls.
Salt Creek	83,160
Big Muddy	3,515
Lance Creek	685
Pilot Butte	110
Lander	650
Lost Soldier	1,000
Rock River	4,525
Grass Creek	3,820
Hamilton Dome	340
Elk Basin	1,800
Greybull	165
Osage	775
Ferris	710
Cat Creek	6,240
Sunburst	950
Miscellaneous	500
Total	108,945

West Kentucky-Tennessee

By VERN T. WHITNEY

Makeever Bros.' No. 20 Sandidge in Belcher-Sandidge Pool, Warren County, Kentucky, pumped 25 bbls. the first four hours after a shot at from 575 to 593 feet. In same district, Carter Oil Co.'s No. 1 Lawrence is a duster at 1,433 feet. Only completion in Barren County was Oliver Oil & Gas Co.'s No. 8 Smith, which made 12 bbls. at first pumping at 450 feet.

BOWLING GREEN, Ky., Feb. 26.

The recent rapid advances in the price of Somerset crude have already done much to stimulate activity in the western Kentucky Fields. The present price of Somerset crude, $2.61, makes this field very attractive to the operator, especially as drilling and development costs are at a minimum. While the price of crude in 1920 reached $4.25, at that time drilling costs were as high as $4.50 a foot, tubing around 24 cents and 6¼-inch casing as high as $2 at bootleggers' prices. Drilling costs now run from as low as $1.25 per foot in Allen County to $2.50 in some sections of Warren County, with an average of around $2 per foot, and equipment is proportionately low.

In addition, in 1920, no acreage could be obtained without paying a fancy bonus, close-in leases commanding as much as $2,000 per acre. At present, many leases are offered the operators for development.

The supply companies report quite an increase in their business, and look for a busy season. They have good stocks on hand, and the operators can be sure of good service.

A careful check on work being done throughout the entire West Kentucky Field shows 176 rigs, either drilling or on location. A report by counties is as follows: Warren, 77; Allen, 61; Barren, 12; Simpson, 9; Metcalf and Ohio, 4 each; Hancock, 3; Calloway, 2; Hopkins, Daviess, Graves and Crittenden, 1 each. There are 7 drills running now in eastern Warren County, due to the recent completion of the Paragon Development Co.'s pipe line.

The well on the Phillips farm on Porter Pike was shot during the week in the St. Peter sandstone at 2,420 feet with 120 quarts. The sand was 100 feet thick, from 2,420-2,520 feet. The shot bridged the hole and has not yet been cleaned out, nevertheless, upon bailing, free oil was found in the well. It is assumed that this oil comes from the 2,420-foot sand and if so this is a very important test, owing to the fact that it will open an entirely new producing horizon.

Producers Holding Up

Recent large completions in Warren County are holding up their production remarkably well. No. 2 J. W. Van Meter in the Browning section, since its completion on January 29, has put more than 1,400 bbls. of crude in the pipe line in approximately 21 days. No. 3 is drilling 400 feet west of No. 2. Barnett and associates are drilling 800 feet southwest of No. 2 Van Meter at 775 feet. O. J. Daugherty and J. C. Howes, during the week, purchased 36 more acres of the Van Meter farm adjoining their production on the east, on which a test will be spudded within the next few days. The location will be 600 feet east of their No. 2 well on the same farm.

One of the important completions of the year is No. 3 J. W. Lowe, of the Miami Oil & Gas Syndicate in the northeast extension area. This well is 1,109½ feet deep. On Saturday, a week ago, it pumped and flowed 35 bbls. in two hours and pumped 65 bbls. the next day in five hours. During the latter part of the week, it was making 50 bbls. daily. No. 4 will be spudded in next week 420 feet southwest of No. 3.

The best completion for the past week in Warren County is the No. 20 Sandidge of Makeever Bros., in the Belcher-Sandidge Pool. The well pumped 25 bbls. the first four hours after a 40-quart shot at from 575 to 593 feet. No. 21 has spudded in 400 feet west of No. 20. In the same district, the Carter Oil Co.'s No. 1 Lawrence is a duster at 1,433 feet. The shale was found from 1,112 to 1,210 feet and the sand from 1,302 to 1,310 feet. This well was drilled 900 feet southwest from the No. 3 well on the adjoining Andy Belcher property, which was drilled in over a year ago, making 110 bbls. flush at 118 feet below the shale, and which is still pumping 25 bbls. daily. Altogether there has been seven wells drilled on the Belcher property which are now pumping 55 bbls. daily at depths ranging from 1,100 to 1,150 feet.

In the Davenport Pool, the well recently completed by the Lester Producing Co. on its M. M. Ennis lease, flowed considerable oil while being tubed, and this caught fire and demolished the rig. Considerable oil was also lost.

In the Rockfield-Browning district southwest of Bowling Green, No. 2 well on the Barbee 30 acres had a small showing of oil in the shallow sand found at 425 feet and has been abandoned. On the adjoining Bettersworth lease, the Hunt Oil Co.'s No. 9 had a very good show of oil at 235 feet and is being drilled on down to the second shallow pay which is found at around 450 feet. On the H. Shannon lease near Richpond, Doak & Simon completed a 5-bbl. pumper after shooting from 443 to 458 feet. On the Bryant 45 acres, No. 4 is dry in the shallow sand at 550 feet. It is the intention of the operators to drill the well on down to the deep pay below the shale.

Allen County

The most interesting test in Allen County is being drilled by the Olive Green Oil Co. on the J. W. Conners farm, one-quarter mile east of the Burton Bros.' production in north Allen County. This test is now drilling at a depth of 950 feet, 715 feet below the shale, in a brownish gray lime.

In the Gainesville district, the White Plains Oil & Gas Co.'s No. 3 L. E. Buchanon is dry at 427 feet. The other two wells on this property made fair pumpers and extended the Gainesville Pool further to the north. On the Morehead 58 acres in the same vicinity, H. L. Ogles' No. 1 is a small stripper at 350 feet. No. 11 on the Grubbs farm, being operated by H. L. Ogle and Bob Rehm is a 15-bbl. pumper after a 20-quart shot at 300 feet. The Kentucky-King Syndicate's No. 4 Ed Ritchie is showing for 5 bbls. flush at 283 feet.

In the Satterfield Pool, No. 15 M. Willoughby is showing for 3 bbls. after shooting at 481 feet. Bayly, Kommisk and Kirk of Lima, Ohio, have made arrangements for drilling several more wells on their Smith-Cooksey lease on which they have completed 9 wells, making approximately 35 bbls. daily.

In the Keen Pool district, the Fishburn Syndicate's No. 6 on the D. Fishburn is showing a large amount of salt water, which is being pumped off in an effort to get it on oil. Dunaway & Co.'s No. 1 L. Absher has been abandoned at around 700 feet. Lawrence & Co. abandoned No. 3 on the Thelakel lease after shooting at 523 feet.

The No. 1 W. L. Hayden, north of the town of Beech Grove in McLean County, has been abandoned at a total depth of 1,007 feet. The Petroleum Extraction Co., who drilled this test, is making arrangements for the drilling of a 3,000 foot hole. The location of the well has not yet been made but it will in all probability be drilled in the vicinity of Beech Grove. **Barren County** operators are again coming to life and a number of rigs have been moved on locations during the past week. It is very likely that the Paragon Development Co. will soon start a 4-inch pipe line from the Cumberland County fields running through part of Cumberland, Monroe, Metcalf and Barren Counties and, due to this rumor, many thousands of acres of leases in the aforementioned counties have been sold during the past 10 days.

The only completion reported in Barren County for the week was No. 8 Smith, being operated by the Oliver Oil & Gas Co. The well made 12 bbls. the first pumping at 450 feet. The Hunt Oil Co. acquired some old production in the Barren County field and officials of the company state that drilling will be started at once on their property.

Notes From Meridian, Miss.

The Harley Development Co.'s well near Houston, Miss., is shut down at 1,900 feet with a small showing of both oil and gas. In water wells at Lauderdale in Lauderdale County, Alabama, drinking water for the past few months has tasted so strong of oil that they had to be abandoned. Due to this reason, a group of local capitalists are arranging to start a test for oil near the city limits of Lauderdale. The test being drilled by Sam Kendall of Meridian, Miss., near the town of Corpota in Sumter County, Alabama, is reported to be removing 6¼-inch casing, which will be replaced with 8¼-inch casing to shut off water at 1,000 feet before drilling into the Blossom sand that should be encountered within the next 50 feet. The well is now down 1,030 feet in Gumbo, with a show of both oil and gas.

GROSS CRUDE STOCK CHANGES FOR JANUARY

NEW YORK, Feb. 24.—Pipe line and tank farm gross domestic crude oil stocks in the United States increased 1,007,000 bbls. in the month of January, according to figures compiled by the American Petroleum Institute from reports made to it by representative companies.

The net change shown by the reporting companies accounts for increases and decreases in general crude oil stocks, including crude oil in transit.

The changes shown by the major territories follow:

	Bbls.
East of the Rockies, increase	1,042,000
California, decrease	35,000
Total, net increase	1,007,000

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California Field Operations

By L. P. STOCKMAN

LOS ANGELES, Calif., Feb. 24.

The total production of crude oil in California for Jauary amounted to 16,457,445 bbls., an average of 530.885 bbls. per day. This is an increase of 33,246 bbls. per day over December production.

Stocks increased during the month, 1,450,660 bbls. The total stocks at the end of the month were 62,635,588 bbls.

Seventy-eight wells were completed during the month with an initial daily production of 102,739 bbls., compared with 64 wells completed during December with an initial production of 62.333 bbls.

Production

(Figures for Production and Stocks are in barrels of 42 gallons)

District—	Barrels Per Mo.	Daily Average Jan.	Dec.
Kern River	620,028	20,001	19,685
McKittrick	187,286	6,041	6,503
Midway-Sunset .	2,457,757	79,282	76,599
Elk Hills	808,641	26,085	27,384
Lost Hills-Belridge	244,456	7,886	6,658
Coalinga	430,094	13,874	14,010
Santa Maria	261,787	8,445	8,164
Ventura-Newhall	315,670	10,183	10,409
Los Angeles-Salt Lake	110,835	3,575	3,333
Whittier	59,521	1,920	1,820
Fullerton	316,361	10,205	10,575
Coyote	532,512	17,179	17,709
Santa Fe Springs	3,825,197	91,122	89,730
Montebello	373,439	12,046	12,300
Richfield	592,623	19,117	19,389
Huntington-Newport	2,492,012	80,387	63,199
Long Beach	3,733,355	120,431	107,785
Torrance Redondo	84,831	2,736	2,176
Summerland	4,510	146	149
Watsonville	1,876	60	60
Wheeler Ridge ..	4,654	150	....
Total 16,457,445		530,885	497,639
December 15,426,810		497,639	.....
Increase 1,030,635		33,246	

Stocks

Field, refinery, pipe line and tank farm stocks or crude, residuum and tops were as follows:

Heavy Crude, heavier than 20° A. P. I., inculding residuum at December 31, 1922	40,857,761	
Refinable Crude, 20° A. P. I. and lighter, at December 31, 1922	17,414,355	
Tops at December 31, 1922	2,912,812	
Total stocks at December 31, 1922 ...		61,184,928
January production of Crude Oil		16,457,445
Total		77,642,373
Indicated consumption		15,006,785
Heavy Crude, heavier than 20° A. P. I., including residuum at January 31, 1923....	40,478,889	
Refinable Crude, 20° A. P. I. and lighter, at January 31, 1923....	18,870,391	
Tops at January 31, 1923	3,286,308	
Total stocks at January 31, 1923		62,635,588
Stock increase January		1,450,660
Total quantity of above products held at refineries January 31, 1923.....		13,316,038

Long Beach

Several new wells were completed in the Long Beach Field during the past week, the largest of which stands to the credit of the Evans Oil Syndicate. This well, the syndicate's first producer, was brought in from 3,902 feet. It is making 3,050 bbls. of 28 gravity oil, with a cut of about 5 per cent, which it is believed will clean up. MacMillan & Davis completed No. 2 Jackson during the week as a 2,000-bbl. producer. The well was drilled to 4,481 feet and flowed for several hours at the rate of 3,000 bbls. a day of 24 gravity oil, but a short time later it settled to 2,000 bbls. Another good well brought in during the past few days was No. 2 Rissman of the Hub Oil Co., drilled to 3,384 feet. This well is flowing 1,850 bbls. of 22 gravity oil with a cut of less than one-half of 1 per cent. Hager & Dennison's No. 2 White, which was bailed for several days, started off as a 3,000-bbl. well, but water broke in and preparations are now being made to effect a water shut-off. Another well to develop water trouble during the past few days was the Monrovia Oil Co.'s producer brought in last week as a 2,000-bbl. well. This well is also being recemented and the company expects to bring it back around 2,000 bbls. The Transport Oil Co. successfully completed its third well in the field by bringing in No. 3 Johnson & Lindis as a 1,000-bbl. producer. The well was drilled to 3,902 feet and is flowing clean 28 gravity oil. In addition to these large wells, two smaller ones were completed. No. 1 Tobin of the Wiley Oil Co., doing 375 bbls., and well No. 1 of the Black Star Oil Co., doing 625 bbls. The former was drilled to 3,815 feet and the latter to 3.503 feet. Both wells are testing 23 gravity. The discovery well, No. 1 Alamitos of the Shell Oil Co., after being redrilled and deepened to 4,550 feet, was recompleted during the week as a 4,000-bbl. well. This well, which opened up the Long Beach Field, was never a large producer, the maximum output from the upper sand being about 150 bbls. The completion of this well, together with No. 4 Alamitos, completed during the past few days as a 3,500-bbl. well, makes the Shell's Alamitos property some of the best in the field. Another good well brought in during the week, after being redrilled and deepened, was No. 1 Miller of the Superior Oil Co. This producer was drilled to 4.365 feet, and the output of 3,075 bbls. of clean oil is testing 30 gravity.

Santa Fe Springs

The General Petroleum Co. during the latter part of the week added its usual weekly completion in the Santa Fe Springs Field by bringing in No. 85 Santa Fe from the Bell sand at a depth of 3,915 feet. The initial output of the well was 1,750 bbls. and the oil is testing 32.2 gravity. The Superior Oil Co. and C. C. Julian also brought in good wells. No. 2 Wardman of the Superior Oil Co. was drilled to 4,460 feet and Julian's No. 4 to 4,654 feet. The former is making 6,600 bbls. of 35 gravity oil and the latter 5,720 bbls., which is testing 34.8 gravity. On the Farwell property the Union Oil Co. completed No. 2 as a 1,600-bbl. well. It was drilled to 3,898 feet and the oil is testing 29 gravity. The Union has several wells on the Bell lease, one on the Alexander, one on the Howard and two on the Myer lease, which are rapidly approaching completion depths and this company will no doubt show a substantial increase in production in the near future. The Amalgamated Oil Co., after drilling No. 1 Tscheppe to 4,828 feet, bailed the well down, but the flow was mostly water. This companys No. 1 Dalluge, which should be producing oil, is at the present time drilling in hard sand at 4,165 feet. The Shell Oil Co.'s No. 1 Slayden and the Standard Oil Co.'s No. 2 Brownrigg-Keller at the present time are both disappointments. The former is in a hard sandy shale formation 4,710 feet and the latter, but a stone's throw away from a producer, has reached 5,225 feet without showing any indications of any kind.

Huntington Beach

Of the four new wells completed in the Huntington Beach Field during the past week, three wells were good producers from the deep sand and one well, that of the Central Oil Co., drilled to 3,440 feet, was making only 65 bbls. a day. The Selby Root interests brought in No. 2 Clark, a 3,250-bbl. well, from 4,905 feet and the oil is testing 27 gravity. The Amalgamated Oil Co. completed two good wells, No. 2 Dennison, a 2,800-bbl. well, and No. 30 Miley-Keck, a 2,950-bbl. well. The former was drilled to 4,882 feet and the latter to 4,520 feet. The output from both wells is testing approximately 27 gravity. The Petroleum Midway Co. recompleted two wells during the week after redrilling and deepening them several hundred feet. No. 1 Elliott, drilled to 4,170 feet, was good for 1,500 bbls. of 25 gravity oil, while No. 2-A Thornton started off at 1,000 bbls. a day from 4,288 feet. The Shell Oil Co.'s No. 1 Ashton, recompleted several weeks ago after being redrilled and deepened, reached a maximum production during the past week of 4,550 bbls., while the Union Oil Co.'s No. 11 Copeland, completed last week at 1,884 bbls., showed an increase of approximately 200 bbls. a day.

Miscellaneous Drilling

In the Torrance Field the only event of importance during the past week was the completion of No. 2 Waddell by the Fullerton Oil Co. The new producer was drilled to 3,503 feet and showed an initial production of 155 bbls. of 15 gravity oil. In the Bellflower district, the Cal-Petro Oil Producers Syndicate reached a depth of 3,100 feet in the company's first well, and abandoned No. 2 at 800 feet as the result of an unsuccessful fishing job. The rig was skidded and 100 feet of hole made in the new well. There were no new developments in the Bandini district except that the several operators continued drilling ahead. In the San Jose Hills the Mascot Oil Co. suspended operations pending the outcome of wells drilling nearby. It is reported that H. A. Bardeen has taken over the wildcat being drilled in this vicinity by the Crittenden Oil Co. and preparations are being made to deepen and redrill it. It is understood that the company had but one drilling site, which was given it in order to prove up surrounding leases. The Dabney Oil Syndicate is sidetracking 8¼-inch casing in the company's wildcat well being drilled near Seal Beach, while the well of the Seal Beach Oil Co., being drilled nearby, is still suspended at 4,500 feet. Several wells are being drilled in the vicinity of Wilmington, and in one, that the Sentinel Oil Co., slight oil and gas showings have been encountered.

Vessel Shipments

Intercoastal shipments of crude and fuel oil for the past week from Los Angeles harbor totaled 780,000 bbls., of which 535,000 bbls. were destined for New York, 75,000 bbls. for Fall River, 100,000 bbls. for Tampico and 70,000 bbls. for Balboa for diversion upon arrival. The tankers leaving for New York were the Agwistone, with 120,000 bbls.; Devolente, with 80,000 bbls.; Agwihavre, with 110 000 bbls.; Dillwyn, with 85,000 bbls., and the William Rockefeller, with 140,000 bbls. The 75,000-bbl. cargo of crude for Fall River was taken in the tanker Swiftwind for the New England Oil Co., while the 100,000 bbls. of crude destined for Tampico was taken in the tanker San Melito and charged to the Eagle Oil Co. The remaining item, 70,000 bbls. for Balboa, was carried in the British tanker Conus. During the same period the Shell Oil Co. transported 315,000 bbls. of southern California crude by tankers to its Martinez refinery and the Standard Oil Co. moved 260,000 bbls. to its Richmond refinery near San Francisco. A shipment by the Associated Oil Co. of 75,000 bbls. to that company's Avon refinery and a shipment of 55,000 bbls. of fuel oil for commercial consumption brings the total exports from the local harbor for the week to 1,485,000 bbls. From San Francisco during the same period, the Shell Oil Co. shipped 60,000 bbls. of fuel oil to Balboa and the Associated Oil Co. shipped 60,000 bbls. of fuel oil to Astoria and 30,000 bbls. of refined products to Seattle. The Standard shipments of fuel oil totaled 90,000 bbls., 40,000 bbls. of which went to Astoria and 50,000 bbls. to Shanghai.

Oil field operations reported to the State oil and gas supervisor show 21 new wells started, five less than during the previous week. This brings the total for the current year to date to 214, as compared with 179 at the same date last year. The following new wells in the most important fields were started during the week:

Long Beach

Location,	Company and Well—
19-4-12	D'Angelo Oil Co., No. 2.
	E. J. Miley—
19-4-12	Mills, No. 4.
	Shell Co.—
29-4-12	Rose, No. 1.
29-4-12	Nesa, No. 4.
	Signal Union Syn.—
30-4-12	Burnett Villa, No. 1.

Santa Fe Springs

9-3-11	Luneta Oil Co., No. 1-A.
	Petroleum Midway Co. Ltd.—
6-3-11	Standlee, No. 2.
	Standard Oil Co.—
31-2-11	Santa Gertrudes, No. 3.
31-2-11	Santa Gertrudes, No. 4.

Huntington Beach

35-5-11	Holly Oil Co., No. 5.
35-5-11	Holly Oil Co., No. 6.

Torrance

	C. C. M. O. Co.—
9-4-14	Del Amo, No. 5.
	Petroleum Midway Co. Ltd.—
9-4-14	Casad, No. 1.

Late News From the Fields

TULSA, Okla., Feb. 28.

Revised figures on production from the Tonkawa Field for the week ending February 14 show a daily average of 71,165 bbls. from 108 wells.

The dearth of completions in this pool was brought to a close Monday by T. B. Slick and the Comar Oil Co.'s No. 2-B Endicott, SW cor. SW, Section 35-25-1w, which was good for 2,400 bbls. a day in sand at 1,962-80 feet.

McCaskey & Wentz completed No. 10 McKee, NW cor. NE SW, Section 34-25-1w, which made 1,000 bbls. in 18 hours, sand at 1,977-1,982 feet.

The Comar Oil Co.'s No. 6 Endicott, SE cor. Section 34-25-1w, started at 1,200 bbls. in sand at 1,960-2,000 feet.

The Wilcox Oil & Gas Co.'s No. 2 Barnett, C SW NW SW, Section 25-16-9, Bristow Field, Creek County, was making 350 bbls. on top of the Dutcher sand found at 2,880 feet.

The Peters Petroleum Corporation has purchased the acreage and production of Joe Abraham in Creek County, amounting to 2,500 acres of leases scattered over the county, with a large part of it in the Bristow district. Daily average production of about 1,150 bbls. was included in the deal. Consideration was approximately $1,000 000 cash.

In Osage County, the Verland Oil Co. completed No. 5, CSL SW SW, Section 31-27-10, as a 12-bbl. pumper after a 60-quart shot in sand at 1,940-61 feet. The Owen Osage Oil Co.'s No. 1 Serial 233, CNL NW NE SE, Section 10-27-11, made 1,250,000 feet of gas from the top of the Mississippi lime at 1,900-08 feet. J. R. Hadley has abandoned No. 2, CEL W half E half SE, Section 30-27-11, at 1,080 feet. The Wiser Oil Co.'s No. 2, C NE NE, Section 12-26-11, was dry at 2,022 feet. Peters and others finished No. 6, CNL S half S half NE, Section 23-25-9, for 35 bbls. after a 180-quart shot in pay sand at 2,026-65 feet. Same operators' No. 7, CSL SE NE, same section, was good for 35 bbls. after a 180-quart shot in sand at 2,045-84 feet. The Meridian Petroleum Corporation and Chief Big Heart's No. 3-A Goforth, CEL NE NW SW, Section 2-25-11, made 25 bbls. after a 20-quart shot in sand at 1,700-10 feet.

In Okmulgee County, Kimbley and others' No. 3 Hawkins, CEL NE SE, Section 29-13-11, was dry at 3,217 feet.

In Kay County, the Blackwell Oil & Gas Co.'s No. 3 Dieble, CEL SW SE NW, Section 19-28-1e, was abandoned at 1,060 feet. Ossenbeck and others have abandoned No. 1 Big Goose, SW cor. Section 17-25-1e, at 3,230 feet after getting a hole full of water. The Blackwell Oil & Gas Co.'s No. 1-A Ruzek, SE cor. SE NW, Section 3-24-1w, was good for 520 bbls. naturally in sand at 2,645-53 feet.

In Osage County, near Ponca City, the Scarb Oil Co.'s No. 1, SE cor. SE NE, Section 35-25-3e, was dry at 3,980 feet.

In Pawnee County, the Magnolia Petroleum Co.'s No. 1 Robedeaux, SE cor. NE SE, Section 32-23-3e, was dry at 4,040 feet.

In eastern Garvin County, Heath and

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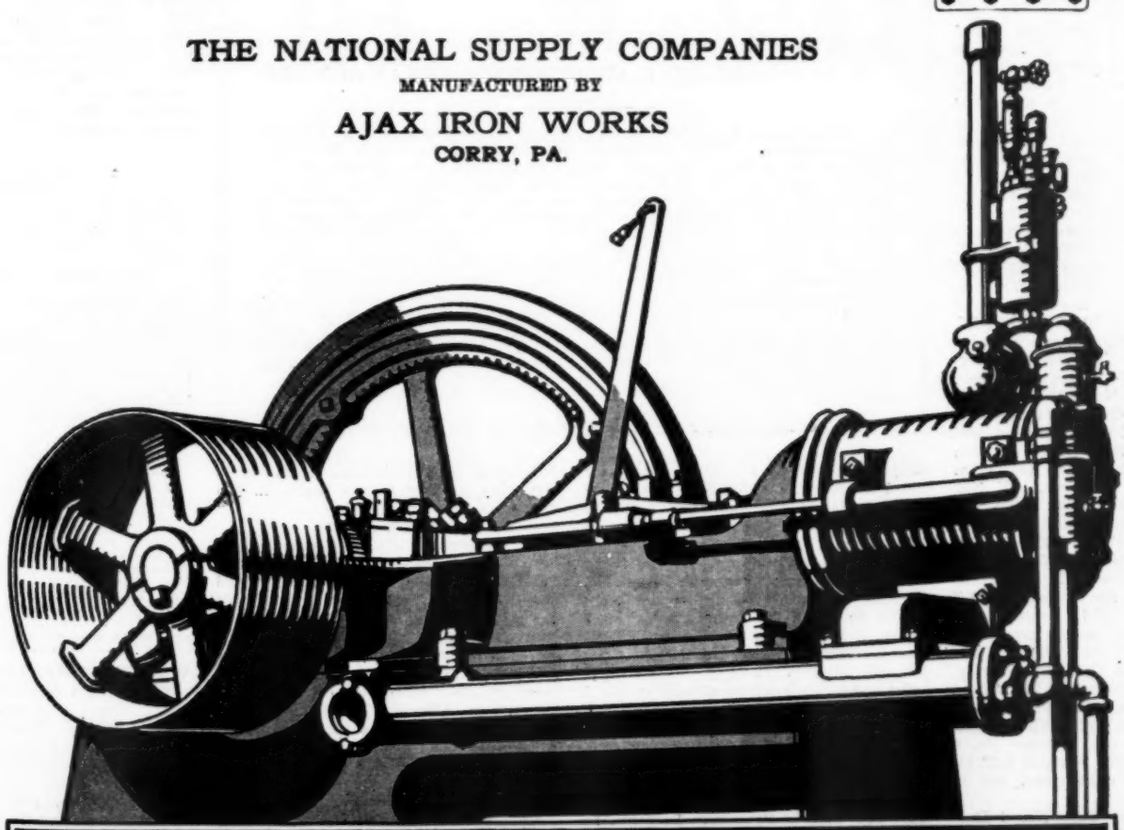

AJAX DRILLING ENGINES

3416

others were pulling casing at 920 feet to install a rotary at No. 1 Kelly, SE cor. SW SW, Section 10-3n-3e.

Late Wildcat News

In northwestern Atoka County, McPherson and others' No. 1 Wilde, CSL SW NW NE, Section 7-2s-9e, was cleaning out at 1,154 feet.

In Johnston County, the Co-Operative Oil Co. was drilling at 1,850 feet in No. 1 Beams, C NE SW NE, Section 29-3s-4e.

In southern Pottowatomie County, Davy & Deitrick were drilling at 1,000 feet and carrying the 12-inch casing at No. 1 McGehee, SE cor. SE NW, Section 10-6n-2e.

In Grady County, Wharton & Allen's No. 1 Freenay, C NW SE SE, Section 12-5n-8w, was dry at 2,508 feet. Kennedy and others' No. 1, SE cor. SW SE, Section 18-5n-8w, was dry at 2,427 feet. Grogan & Kelly abandoned No. 1 Dahl, NE cor. SW SW, Section 22-5n-8w, at 925 feet. The Sinclair Oil & Gas Co.'s No. 1 Geckler, C SE NE SE, Section 22-5n-8w, was good for 13,000,000 feet of gas at 1,314-90 feet. The Atlantic Petroleum Co.'s No. 1, CSL NE SW SW, Section 25-5n-8w, made 5,000,000 feet of gas in sand at 1,452-59 feet.

Kansas

Half of the 20 completions in Kansas during the week in review were dry holes or insignificant producers. In Greenwood County, however, several good wells were completed, the best production centering about the Seely Pool. A gradual retarding of operations was noticeable in the decreased number of initial operations and an increase in the number of wells shut down.

In Cowley County, Rothvon and others' No. 1 McFadden, CNL SW SE, Section 25-32-4, was good for 200 bbls. after a 30-quart shot in sand at 1,484-89 feet. The Emerald Oil Co.'s No. 5 Kukuk, C SW NE, Section 24-32-4, started off at 250 bbls. the first 24 hours after shooting sands at 1,426-56 and 1,461-80 feet with 20 quarts each. The Ramsey Lloyd Oil Co.'s No. 1 Hiatt, SE cor. Lot 27, Section 7-31-8, was dry at 3,385 feet.

In Butler County, Shawver & Sutter's No. 2 Myers, CEL NE SW, Section 27-28-5, made 150 bbls. after a 100-quart shot in sand at 2,772-92 feet. The following dry holes were finished: Tidal Oil Co., No. 6 Bunnell, SE cor. SW NW, Section 26-28-5, at 3,240 feet; Snowden & McSweeney, No. 1 Nollenberg, SW cor. NW NW, Section 35-28-6, at 2,952 feet; Branson and others' No. 2 Doughty, NE cor. SW, Section 5-27-6, at 3,304 feet, and Brimm Oil Co., No. 1 Errickson, SW cor. Lot 17, Section 18-29-8, at 3,001 feet.

In Greenwood County, the Lewis Oil Co.'s No. 1 Berrier NW cor. SW NE, Section 16-25-9, was dry at 2,406 feet after a show at 2,321-31 feet. Glaman and others' No. 1 Nixon, NE cor. Section 19-24-10, was dry at 2,355 feet.

The best well of the week in review was Johnson & Vickers' No. 3 Seely, C SE NW SW, Section 5-23-11, which made 600 bbls. initial after a 100-quart shot in sand at 1,904-60 feet. The White Eagle Oil & Refining Co.'s No. 5 Seely, C SE NE NW, Section 5-23-11, started at 275 bbls. after a 140-quart shot in sand at 1,934-73 feet. The White Eagle Oil & Refining Co. and Nelson's No. 4 Seely, C SW NE SE, Section 5-23-11, made 225 bbls. after a 100-quart shot in sand at 1,905-55 feet.

The Barrington Oil Co.'s No. 3 Burkett, C NE NW NE, Section 24-23-10, was dry at a total depth of 2,150 feet after passing through sand at 2,090-2,115 feet. The same company's No. 2 Burkett, C NW NW NE, same section, was good for 85 bbls. after an 80-quart shot in sand at 2,078-2,108 feet. The same company's No. 7 Burkett, C NE NW NW, same section, made 100 bbls. after a 120-quart shot in sand at 2,038-2,138 feet. The Mid-Kansas Oil & Gas Co. passed up a show in sand at 1,838-58 feet and went down to sand at 2,024-2,101 feet, where No. 3 Allen, C NE SE NE, Section 23-23-10, was finished for 100 bbls. after an 80-quart shot. Rogers and others abandoned No. 2 Dehlinger, SW cor. SE NW, Section 32-23-13, after a 90-quart shot in sand at 1,698-1,701 feet. Total depth was 1,746 feet.

The Ralco Oil Co.'s No. 10 Shambaugh, CWL E half NW, Section 22-23-13, was good for 350 bbls. after a 100-quart shot in sand at 1,582-1,622 feet. Winkler and others' No. 5 Lovett and others, CNL NE SW, Section 14-23-13, made 5 bbls. of oil and 20 bbls. of water after a 40-quart shot in sand at 1,816-46 feet.

Butler County showed an improvement in the number of new operations during the past week: The Phillips Petroleum Co. led in the Butler County work, staking six locations as follows: No. 2 Shepherd, NW cor. SW NW NW, Section 7-24-5; No. 4 Davis, SE cor. SW SE SE, Section 12-24-4; No. 2 Hopkins, NW cor. same section; No. 2 Warline, NE cor. NW NE SE, Section 2-24-4; No. 1 Paulson, CEL NW, Section 1-24-4, and No. 2 Wilson, SW cor. Section 31-23-5. Locations were made by Clark and others at No. 1 Bush, SW cor SE, Section 21-26-3, and by the Prairie Oil & Gas Co. for No. 4 Moore, C SW NW SE, Section 36-24-3. The Skelly Oil Co. and Davis had a rig up for No. 3 Van Winkle, NE cor. SE SW, Section 19-27-6. Pryor & Lockhart staked a location for No. 1 Bush, SE cor. Section 36-29-4.

In Marion County, Bellport had a rig up at No. 1 Batt, NE cor. SE SW, Section 4-19-14.

In Lyon County, R. G. Gillespie had a rig on the ground at No. 3 Sterling, C SW NW NW, Section 26-22-11. The Empire Gas & Fuel Co. had a rig up for No. 1 Hind, SW cor. SE SW, Section 11-21-11, and Setzer & McDougal were rigging up at No. 3 Gardner, NW cor. SE NE, Section 1-22-11.

In Greenwood County, the following new rigs were up: Rogers & Bitler, No. 3 Allen, NW cor. SW, Section 18-23-11; White Eagle Oil & Refining Co., No. 7 Seely, C NW NE NW, Section 5-23-11, and Altenberg & Oyler, No. 6 Pees, CNL SE SE, Section 12-24-12. The Gypsy Oil Co. had a rig on the ground at No. 1 Nixon, SW cor. SW SE, Section 34-24-9. The Arkansas Fuel Oil Co.'s No. 1 Kulander, SE cor. NW, Section 6-24-13, was drilling at 700 feet. The Hazel Oil Co. was drilling at 1,200 feet in No. 3 Dame, SW cor. SE SW, Section 12-24-12. The Vincent Petroleum Co.'s No. 14 Dame, CEL SW SW, same section, was drilling at 500 feet. The Franklin Oil Co.'s No. 8 Dalton, CWL SW SE, Section 11-24-12, was drilling at 400 feet.

In Cowley County, Shawver & Sutter have a rig up for No. 1 Brown, NE cor. NW SE, Section 3-30-4. The Derby Oil Co. had timbers on the ground for No. 1 Joslin, SW cor. NW SW, Section 11-30-4. Rothvon and others have staked a location for No. 2 McFadden, NE cor. SW SE, Section 25-32-4. The Derby Oil Co. was rigging up a machine at No. 1 McFadden, CSL NW SE, same section, and the Carter Oil Co. had made a location for No. 1 McFadden, NW cor. SE SE, same section.

Canadian Field

CHATHAM, Ont., Feb. 26.

The first word from the Imperial Oil (Ltd.) drilling crews wintering in the far north was brought by Ronald McKinnon, who arrived in Edmonton a few days ago, having made the trip from Fort Norman to Waterways by dog team. The tanks at the discovery well below Fort Norman are full of crude oil, but no drilling has been done since the freeze up. The drilling crew on the ground will, however, resume work as soon as possible in the spring.

It is understood that the discovery well, which flowed open for a while after the second strike last summer, was successfully capped by Angus Sutherland and his drilling crew last fall. In place of continuing the well at C Camp, on the west bank of the Mackenzie, which was down 1,500 feet or more, Mr. Sutherland commenced a new hole, drilling through 75 feet of frost. Considerable trouble was experienced with water supply and drilling was discontinued when cold weather set in. It is unofficially reported that Imperial Oil (Ltd.) is staking additional territory.

The Fort Norman Oil Co. of Toronto, which has a test down 1,525 feet on a location some miles north of the Imperial's discovery well, is reported arranging to drill deeper next year. The well, drilled in 1921, developed some gas light outfit and has enough gas to use for fuel. A standard outfit is being brought in for deeper drilling.

Northern Alberta

In the Irma-Viking-Wainwright district, British Petroleum (Ltd.) No. 1, Section 36-45-7-4, east of Fabyan, has resumed drilling after a couple of weeks shut down at between 1,500 and 1,600 feet. Mutual Oil & Gas Co., Section 14-47-27-4, near Pigeon Lake, has closed down for the rest of the winter, having encountered a very difficult bituminous formation. Drilling will resume in the spring.

In Peace River district, Canadian Petroleum Co. (San Joaquin No. 2), Section 12-85-21-5, is down 2,000 feet with showings of gas and oil, there being sufficient gas to run the boiler. The location is about 15 miles north of Peace River town. The Victory-Alberta oil interests, which are drilling at Peace River town, held a shareholders meeting at Saskatoon recently, when some progress was reported with the drilling, the test having reached about 1,500 feet. The drilling will be carried deeper to test the Devonian formation.

Ontario Operations

In the Ontario fields, further oil and gas showings have been encountered in new drilling on the Ben Doran farm near Meaford, in Grey County. In all, four wells have been put down in this area in the last few years, the drilling operations being financed largely by Mr. Doran himself. The wells vary in depth from 800 to 900 feet and gas has been encountered at pressures ranging from 40 to 200 pounds, but in comparatively small quantities. Some oil has been encountered. Two of the wells have filled up about 400 feet with oil and salt water. The showings are in the Trenton limestone. It is probable that the search for a suitable structure with a commercial production will be continued.

SHREVEPORT'S GAS SUPPLY MENACED BY BILL ADOPTED BY TEXAS SENATE

SHREVEPORT, La., Feb. 26.—Questions affecting the carbon industry are again being agitated and figures have been compiled which show that sufficient gas is being used each day by carbon plants in the Monroe gas field to supply the city of Shreveport for 60 days. Efforts of the local gas distributing company to increase its rates led to a series of investigations which reveal that the present sources of supply for this city will soon be inadequate and that something must be done to conserve the supply in other fields in North Louisiana for future use. The carbon industry is looked upon as a more or less migratory enterprise and it is said industries of a more permanent nature are loathe to locate where the carbon plants are permitted. Passage of the Strong bill by the Texas senate last week constitutes a new menace to Shreveport's gas supply. The bill permits the operation of carbon plants anywhere within 25 miles of the border in Texas and the entrance of the carbon manufacturers into the Bethany Field in Panola County on which Shreveport is largely dependent for its gas supply, will probably follow.

Southern Alberta

In Sweetgrass district, southern Alberta, Coutts-Sweetgrass Oils (Ltd.) (McLean), Section 1-1-15-4, is reported down 2,850 feet and shows considerable gas with a lot of water. The outfit is shut down owing to cold weather. The water will probably be cased off before drilling further. Cold weather has interfered seriously with most of the drilling in southern Alberta. The Smiley Syndicate is reported getting ready to resume work on Oil Lands Exploration Co.'s No. 1, Section 2-1-15-4. Just across the border in Montana, the Coe well, shut down last fall at 900 feet, is to resume.

Canadian Oil & Refinery Co. (Rowe-Segur), Section 29-1-11-4, is reported down over 700 feet and drilling again after some delay with a broken bit. Imperial Oil (Ltd.) Red Coulee, Section 5-1-16-4, is reported to have resumed fishing operations. The Imperial Oil (Ltd.) tank farm at Coutts last week made its initial shipment of Sunburst crude to the Regina, Saskatchewan, refinery by tank car.

In Medicine Hat district, Community Oil Wells (Ltd.), Section 19-14-1-4, near Many Island Lake, is reported drilling around 2,140 feet. Medicine Hat Petroleum (Ltd.), Section 14-11-6-4, 1½ miles southeast of Bull's Head Station on the Crow's Nest line, is down 775 feet with a production but no oil. F. H. Stover is arranging to take a crew north in the spring.

STATISTICS

The following table shows the runs and shipments by the various pipe lines in the oil fields of New York, Pennsylvania, West Virginia, Kentucky, Tennessee, Ohio and Indiana:

Runs February 1 to 18, Inclusive

National Transit Co.	117,268
South West Pa. Lines	44,724
Eureka P. L. Co.	221,618
Buckeye P. L. Co. (Lima)	73,483
Buckeye P. L. Co. (Macksburg)	135,706
Cumberland P. L. Co.	193,029
Indiana P. L. Co.	8,159
New York Transit Co.	7,490
Tide Water Pipe Line (Pa. Oil)	71,634
Tide Water Pipe Line (Ill. Oil)	14,894
Total	887,824
Average runs	49,324

Shipments, February 1 to 19, Inclusive

National Transit Co.	1,227,900
South West Pa. Lines	157,814
Eureka P. L. Co.	90,462
Buckeye P. L. (Lima)	82,702
Buckeye P. L. Co. (Macksburg)	145,641
Cumberland P. L. Co.	64,430
Indiana P. L. Co.	30,471
New York Transit Co.	6,070
Tide Water Pipe Line (Pa. Oil)	231,547
Total	1,137,037
Average shipments	59,842

WRONG IMPRESSION CORRECTED BY EMERY MANUFACTURING CO.

The Emery Manufacturing Co. of Bradford, Pa., has written The Oil and Gas Journal as follows:

"A news item recently published in some of the trade journals stated that the Bradford Gasoline Co. had purchased the gasoline plant located at South Bradford from the Emery interests.

"Some of our friends and customers were misled by this news item, understanding from it that the Emery Manufacturing Co. had sold their refinery located at Bradford, which is not the case.

"The gasoline plant in question was a casinghead gasoline plant owned by the American Alkali & Acid Co. located at South Bradford. This company is owned by Lewis Emery, Jr., who is also the proprietor of the Emery Manufacturing Co.

"We shall be very grateful to you if you will publish these facts in your next issue."

READING

STEEL VALVES

A century ago the ability of steel to retain its valuable physical properties under a certain condition involving high or fluctuating temperatures was first investigated. Developments of the past few years in the direction of higher operating temperatures, in steam power stations and refineries particularly, have led to an increasing number of investigations. The consistently improving results of these investigations arise from more accurate means and methods of making tests and advancement in manufacturing practices.

Reading early entered the field of cast steel fittings and valves and has since devoted intensive effort toward perfecting the manufacturing practices involved. Reading valves therefore yield the user the full benefit of the resistance to deterioration of the desirable qualities of steel under temperature without loss of advantage due to faults of foundry practice.

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FEBRUARY FIELD WORK SHOWS SLUMP

Fewer Wells Completed Than in January and a Considerable Falling Off in Results Shown in Initial Production. Oklahoma Leads in Results. Arkansas' New Production Drops More Than 50 Per Cent.

RESULTS IN ALL FIELDS

Summary of Wells Completed

District—	Comp.	Prod.	Dry	Gas
*Eastern	291	1,262	6	4
Central Ohio	26	21	10	13
Lima	38	892	2	0
Indiana	11	159	4	0
Kentucky	125	2,032	37	11
Tennessee	6	105	4	0
Mississippi	0	0	0	0
Illinois	23	672	9	0
Oklahoma	431	108,981	119	52
Kansas	127	5,620	55	4
North Central Texas	266	15,875	88	8
East Central Texas	13	525	8	0
Gulf Coast	150	16,120	42	0
Arkansas	98	45,425	11	18
North Louisiana	16	1,300	3	0
Wyoming	30	8,420	2	0
Montana	6	760	0	0
Utah	0	0	0	0
Toatl Feb.	1,657	208,169	400	110
Total Jan.	1,878	270,074	508	244
Difference	221	61,905	92	134

Summary of Rigs and Wells Drilling

District—	Rigs	Drg.	Ttl.
*Eastern	199	384	583
Central Ohio	31	76	107
Lima	5	59	64
Indiana	0	30	30
Kentucky	0	287	287
Tennessee	0	12	12
Mississippi	0	11	11
Illinois	1	40	41
Kansas	83	219	302
Oklahoma	395	1,164	1,559
North Central Texas	115	388	503
East Central Texas	4	88	92
Gulf Coast	84	369	453
Arkansas	159	378	537
North Louisiana	16	71	87
Wyoming	107	354	461
Montana	33	161	194
Utah	1	21	22
Total Feb.	1,333	4,112	5,345
Total Jan.	1,195	4,173	5,368
Difference	38	61	23

*One district, Allegany, missing.

While the omission will not change the general results, the fact that the summary of February operations from one field in the Eastern division, Allegany, are missing, makes it impossible to accurately draw comparisons between the four weeks included in the February report and the four weeks in the January report. Notwithstanding this, it is plain that there was a considerable falling off in the number of completions, occasioned of course by the fact that February is the most severe of the winter months. The new production fell off appreciably, the greatest slump having taken place in Arkansas, where the Smackover Field gave evidence of having seen its biggest days. Oklahoma came through with an increase of 78,944 bbls. in initial production from 58 fewer completed wells.

When the complete returns from the Eastern field are in the review for all the fields will be discussed more fully.

OKLAHOMA

Summary of Wells Completed

County—	Comp.	Prod.	Dry	Gas
Washington	3	0	3	0
Nowata-Rogers	7	19	2	1
Osage	62	24,480	8	8
Tulsa	12	635	2	3
Okmulgee	37	1,887	14	3
Okfuskee, Hughes, Seminole and McIntosh	43	4,550	21	7
Muskogee-Wagoner	17	310	7	2
Creek	97	28,181	22	5
Pawnee	17	516	7	1
Payne	7	30	4	2
Kay	20	25,175	2	5
Garfield-Noble	17	13,465	3	0
Carter	28	1,993	4	1
Stephens-Cotton	31	1,050	7	4
Miscellaneous	33	6,690	13	10
Total February	431	108,981	119	52
Total January	489	87,925	151	77
Difference	58	21,056	32	25

Summary of New Operations

County—	Rigs	Drg.	Ttl.
Washington	1	8	9
Nowata-Rogers	0	4	4
Osage	91	172	263
Tulsa	6	25	31
Okmulgee	32	94	126
Okfuskee, Hughes, Seminole and McIntosh	46	137	183
Muskogee-Wagoner	9	25	34
Creek	78	153	231
Pawnee	10	52	62
Payne	5	23	28
Kay	38	105	143
Garfield-Noble	26	84	110
Carter	20	74	94
Stephens-Cotton	8	37	45
Miscellaneous	25	171	196
Total February	395	1,164	1,559
Total January	329	1,098	1,427
Difference	66	66	132

Oklahoma completed in February, 431 wells, with an initial production of 108,981 bbls., 119 dry holes and 52 gas wells. In January, there were 489 completions, 87,925 bbls. of new production, 151 dry holes and 77 gas wells.

With production in Osage County holding steadily, as compared with the former month, a gain of 22,056 bbls. in new production was recorded from good wells in Creek County and the Tonkawa Field of Kay and Noble Counties. It is interesting to note that during February, completions numbered 58 fewer than in January, and the dry holes were 32 less, although new output made a material gain, indicating a slump in operations, but showing many new substantial wells.

New operations showed an increase of 66 drilling wells over January, and an increased activity, regardless of winter, was evidenced by the fact that an increase of 66 rigs standing was made in February. The total increase of 132 operations for February is a remarkable advance over the showing made in January. Total rigs standing in February were 395; drilling wells, 1,164, making a total of 1,559.

Production by districts is compared as follows: Washington County, February, none, January 20 bbls.; Nowata-Rogers Counties, February, 19 bbls., January, 117 bbls.; Osage County, February, 24,480 bbls., January, 25,016 bbls.; Tulsa County, February, 635 bbls., January, 192 bbls.; Okmulgee County, February, 1,887 bbls., January, 3,330 bbls.; Okfuskee, Hughes, Seminole and McIntosh Counties, February, 4,550 bbls., January, 1,720 bbls.; Muskogee-Wagoner Counties, February, 310 bbls., January, 345 bbls.; Creek County, February, 28,181 bbls., January, 18,976 bbls.; Pawnee County, February, 516 bbls., January, 240 bbls.; Payne County, February, 30 bbls., January, 400 bbls.; Kay County, February, 25,175 bbls., January, 14,970 bbls., Garfield-Noble Counties, February, 13,465 bbls., January, 10,925 bbls.; Carter County, February, 1,993 bbls., January, 2,005 bbls.; Stephens-Cotton Counties, February, 1,050 bbls., January, 409 bbls.; miscellaneous, February, 6,690 bbls., January, 9,260 bbls.

KANSAS

Summary of Wells Completed

County—	Comp.	Prod.	Dry	Gas
Butler	23	1,405	14	0
Marion	1	100	0	0
Greenwood-Woodson	53	3,017	17	0
Chautauqua-Elk	7	325	2	1
Montgomery-Wilson	10	65	5	2
Neosho-Allen	2	33	0	0
Miami and Franklin	7	30	5	1
Miscellaneous	24	645	12	0
Total February	127	5,620	55	4
Total January	165	7,540	64	18
Difference	38	1,920	9	14

Summary of New Operations

County—	Rigs	Drg.	Ttl.
Butler	12	41	53
Marion	2	7	9
Greenwood-Woodson	55	72	127
Chautauqua-Elk	2	7	9
Montgomery-Wilson	0	5	5
Neosho-Allen	0	4	4
Miami-Franklin	0	4	4
Miscellaneous	12	79	91
Total February	83	219	302
Total January	74	242	316
Difference	9	23	14

A slump in operations in Kansas is shown by the work completed in February. In that month, 165 wells were completed for 7,540 bbls. of new production, with 64 dry holes and 18 gas wells. This was a decrease of 38 completions, 1,920 bbls. of new production, 9 dry holes and 14 gas wells, in comparison with the work completed in January.

Curtailment of operations due to cold weather was responsible, in part, for the drop in production as an increase of 9 rigs standing was made in February. However, only 219 tests were reported drilling in February, compared to 242 in January, showing a total decrease in new work of 14 operations. Greenwood and Woodson Counties showed the largest drop in production with a loss of 1,098 bbls. of new production. Butler County lost 250 bbls. and several of the other districts showed smaller declines.

Production by districts is compared as follows: Butler County, February, 1,405 bbls., January, 1,655 bbls.; Marion County, February, 100 bbls., January 60 bbls.; Greenwood-Woodson Counties, February, 3,017 bbls., January, 4,115 bbls.; Chautauqua-Elk Counties, February, 325 bbls., January, 800 bbls.; Montgomery-Wilson Counties, February, 65 bbls., January, none; Neosho-Allen Counties, February, 33 bbls., January, 169 bbls.; Miami-Franklin Counties, February, 30 bbls., January, 13 bbls.; miscellaneous, February, 645 bbls., January, 728 bbls.

NORTH CENTRAL TEXAS

Summary of Wells Completed

District—	Comp.	Prod.	Dry	Gas
Wichita	81	4,438	26	0
Burkburnett	10	895	4	0
Eastland	27	2,420	8	2
Stephens	21	3,275	6	0
Young	22	1,150	16	1
Archer	42	2,970	11	0
Shackelford	29	191	3	0
Callahan	14	81	6	0
Miscellaneous	20	455	8	5
Total February	266	15,875	88	8
Total January	199	9,712	67	7
Difference	67	6,163	21	1

Summary of New Operations

District—	Rigs	Drg.	Ttl.
Wichita	19	84	103
Burkburnett	6	32	38
Eastland	10	55	65
Stephens	24	52	76
Young	9	39	48
Miscellaneous	47	126	173
Total February	115	388	503
Total January	124	347	471
Difference	9	41	32

There were 266 wells completed in the North Central Texas Fields in the month of February, with initial production of 15,875 bbls. The dry holes numbered 88 and the dry holes 8. February's record was an improvement over that of January, showing 67 more wells completed and new production 6,163 bbls. in excess of the January record. There were 21 more dry holes and 1 more gasser. January's showing was 199 completed wells; 9,712 bbls. in initial production; 67 dry holes and 7 gassers.

Wichita County made the best record in new production with 4,438 bbls., not counting the 895-bbl. showing of Burkburnett.

In new work, there were 115 rigs and 388 wells drilling, a total of 503, while at the close of the January report the rigs numbered 124 and the wells drilling 347, a total of 471, indicating 9 fewer rigs in February, but 41 more wells drilling, a total gain of 32.

EAST CENTRAL TEXAS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Limestone	10	325	6	1	38	39
Navarro	2	200	1	0	11	11
Miscellaneous	1	0	1	3	39	42
Total Feb.	13	525	8	4	88	92
Total Jan.	19	1,165	8	6	98	104
Difference	6	640	0	2	10	12

The East Central Texas Field cut very small figure in Texas operations in month of February. There were only 13 completions reported in the four weeks in review, with a total new production of 525 bbls. There were 8 dry holes. This was 6 fewer completions and a drop of 640 bbls. in new production than January report showed. Four rigs and 88 wells classified as drilling, but with most of them on the shut down list shows the field activity—or lack of it.

GULF COAST

Summary of Field Operations

District—	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Batson	2	20	0	0	3	3
Blue Ridge	1	0	1	0	3	3
Barber Hill	10	1,210	4	5	6	11
Dayton	0	0	0	0	5	5
Damon Mound	8	1,160	2	6	4	10
Edgerly	1	250	0	0	1	1
Goose Creek	18	2,475	6	4	18	22
Humble	6	430	2	0	6	6
Hull	23	3,400	9	11	23	34
Jennings	1	0	1	0	3	3
Markham	0	0	0	0	4	4
Orange	11	1,650	2	10	24	34
Pierce Junction	1	75	0	0	5	5
Spindletop	3	115	0	0	2	2
Saratoga	0	0	0	0	1	1
Sour Lake	4	215	1	1	7	8
Somerset	9	107	0	3	17	20
Vinton	8	750	2	0	10	10
West Columbia	7	800	2	1	13	14
Laredo district	19	3,160	1	6	25	31
Milam County	8	103	0	3	8	11
Miscellaneous	10	200	8	34	183	217
Total Feb.	150	16,120	42	84	369	453
Total Jan.	148	40,565	34	80	373	453
Difference	2	24,322	8	4	4	0

Gas Wells Hull, Orange and Laredo Districts

Increase completions	2
Decrease new production	24,322
Increase dry holes	5
Increase rigs	4
Decrease drilling wells	4

New production in the Gulf Coast Pools, Laredo districts, Somerset and Milam County Fields is off 24,322 bbls. from January, with two more completions than during the first month of the year. The dry holes number 42 compared with 34 last month. Rigs in and derricks up show an increase of 4 over January and drilling wells decrease 4.

Deducting 3,160 bbls. credited to the Laredo districts, and 103 bbls. developed in Milam County, leaves only 12,857 bbls. new production in the Coastal heavy gravity pools, which is the smallest in years.

The Hull Pool fell off from 16,300 bbls. in January to 3,400 bbls. in February. West Columbia declined from 5,255 bbls. to 800 bbls., and Orange from 6,750 bbls. during January to 1,650 bbls.

The Laredo districts show an increase of 525 bbls.

Another feature of the monthly review of operations is that a very large percentage of the initial production came from worked over wells, and many of the wells now drilling in the pools are simply being worked over.

Early in the month, credit balance quotations were advanced 25 cents to $1.50 in all pools except Blue Ridge and Pierce Junction, where Class B, or light grade crude is marked $1.05. The shallow sand Milam County product brings $2. Most of it is run to a local refinery.

LOUISIANA-ARKANSAS

Summary of Field Operations

Districts—	Comp.	Prod.	Dry	Gas	Rigs	Drg.	Ttl.
Louisiana							
Bellevue	1	300	0	0	3	2	5
Caddo	8	495	2	0	3	35	38
Claiborne	6	470	1	0	10	22	32
De Soto	1	35	0	0	0	10	10
Red River	0	0	0	0	0	2	2
Arkansas							
El Dorado	8	2,155	1	0	39	61	100
Smackover, Union Co.	26	16,870	0	4	65	91	156
Smackover, Ouachita County	49	26,300	8	4	30	87	117
La. Wildcats	12		16	1	10	12	68	70
Arkansas Wildcats	3		85	1	0	13	81	94
Total Feb.	114	46,725	14	18	175	449	624
Total Jan.	127	110,131	18	17	149	433	582
Differ.	13	63,406	4	1	26	16	42

Despite unfavorable weather conditions and the fact that operations in the Smackover district were practically at a standstill half the time during the past month, there were 114 wells completed in North Louisiana and Arkansas, and an increase of 16 in the number of drilling wells at the end of the month. Initial production decreased almost by half, the new output from the entire field amounting to but 46,725 bbls., of which 43,170 bbls. came from the Smackover Field. Of the 114 wells completed, 14 were dry holes and 18 gas wells, and the new month starts with a total of 624 drilling wells and rigs throughout the entire field.

(Continued on page 70)

Some Drillers Trust to Luck— Others to Harrisburg Couplings of Forged Seamless Steel

Well drilling is not a standardized practice. Each driller has his own ideas of what to do in any emergency—but the first idea of the most successful is to **eliminate emergencies** as far as possible by taking precautions instead of chances.

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They have learned to expect double strength endurance from Harrisburg Forged Seamless Steel Couplings. They know that these couplings have no welds—no weakness. They know that each one has a perfect thread and a perfect taper—will not gall or strip. They expect uniform dependability from Harrisburg Forged Seamless Steel Couplings—**they never will be disappointed.**

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Oil Price Increases Bolster Securities

Financial Statements Showing Distinct Improvement Provide Another Factor Imparting Strength to Various Stock Issues.

By N. O. Fanning
Room 734, No. 30 Church St., New York

New York, Feb. 26.—Further advances in refined oil prices, notably gasoline, imparted strength to the petroleum stocks during the past week. Another factor which contributed to make these securities strong and active was the issuance by several companies of their annual financial statements. These were, in most cases, highly favorable and registered a distinct improvement over those issued a year ago.

The publication of the financial statement of the Standard Oil Co. of New Jersey, for the first half of 1922, showed clearly the magnitude of this concern's business. In the first six months of the year alone, gross revenue from operations totaled $222,051,945, of which $103,636,941 was credited to the refining division, $42,764,045 to marketing and $75,650,969 to "other" sources. This gross is at the rate of more than $444,000,000 annually, but the actual gross was probably much in excess of this figure, the value of the turnover during the last six months being much higher, due to the improvement registered in the volume of business. These figures of gross, moreover, do not take into consideration income from operation of steamships, which amounted to $13,712,889 and from sundry accounts, totaling $3,990,432, bringing the total gross for the half-year up to $239,755,266. It is estimated that the total income during the whole year exceeded half a billion dollars.

Total dividends received from oil, gas and other companies controlled by the Standard Oil Co. during the first half of 1922, amounted to $8,256,132. Total net income for the period was $12,256,132. The annual statement of the company for 1922, is not expected to be ready for publication until April.

New Oil Flotation

Miller & Co., bankers, are offering for public subscription, 150,000 shares of stock of the Independent Oil & Gas Co. of Delaware. The stock has no par value, and is being offered at $15.50 per share. The company has outstanding, 450,000 shares out of a total authorized amount of 1,000,000 shares. The proceeds of the issue, it is stated in connection with the offering, will be used by the company in the development of present holdings and to acquire additional properties.

The statement says that net earnings before depletion and depreciation for 1922 totaled $2,225,000, and, after charging off depletion to cost and all charges, were $1,666,000, or approximately $3.70 per share of stock to be outstanding. In 1922, cash dividends were paid aggregating $500,000. The properties of the company are located in the Mid-Continent oil field.

Financial Notes

The Buckeye Pipe Line Co. reports for the year ended December 31, 1922, net income of $1,744,396 after taxes and charges, which is equivalent to $8.72 per share ($50 par) earned on the $10,000,000 capital stock, as compared with $1,676,434, or $8.38 per share, earned in the preceding year. The income account for 1922 compares with 1921 as follows:

	1922	1921
Net income	$1,744,396	$1,676,434
Dividends	*7,000,000	1,600,000
Deficit	$5,255,604	†$ 76,434
Profit and loss surplus	4,224,294	9,829,898

*Includes special dividend of $25 per share, amounting to $5,000,000, distributed on December 30, 1922, to stock of record November 29, 1922, of which $3.72 per share was paid out of earnings accumulated since March 1, 1913, and $21.28 per share was paid out of earnings accumulated prior to that date.
†Surplus.

The balance sheet of the Buckeye Pipe Line Co. as of December 31, 1922, compares as follows:

Assets	1922	1921
Plant	$18,021,847	$17,771,112
Material and supplies	371,081	371,179
Cash, etc.*	5,157,208	9,699,939
Total	$23,550,136	$27,842,230
Liabilities		
Capital stock	$10,000,000	$10,000,000
Accounts payable†	2,127,337	1,208,573
Surplus	4,234,294	9,829,898
Total	$23,550,136	$27,842,230

*Includes other investments.
†Includes reserve for taxes.

The New York Transit Co. reports for the year ended December 31, 1922, net income of $549,194 after allowing for taxes and depreciation, equivalent to $10.98 per share earned on the $5,000,000 capital stock, compared with net income of $820,957, or $16.41 per share, earned in the previous year. The income account for the year compares with that of 1921, as follows:

	1922	1921
Net income	$ 549,194	$820,957
Dividends	*4,750,000	800,000
Deficit	$4,200,000	†$ 20,957

*Includes special dividend of $80 per share, amounting to $4,000,000, distributed on December 30, 1922, to stockholders of record December 6, 1922, of which $12.42 per share was paid out of earnings accumulated since March 1, 1913, and $66.58 per share was paid out of earnings accumulated prior to that date.
†Surplus.

The balance sheet of the New York Transit Co. as of December 31, 1922, compares with the preceding year as follows:

Assets	1922	1921
Plant	$6,948,076	$6,754,147
Materials and supplies	128,883	172,439
Cash, etc.	*3,167,588	6,651,361
Total	$10,244,547	$13,577,947
Liabilities		
Capital stock	$5,000,000	$5,000,000
†Accounts payable	1,795,902	1,085,793
Depreciation reserve	1,942,528	1,785,285
Surplus	1,506,063	5,706,869
Total	$10,244,547	$13,577,947

*Includes reserves for taxes and insurance.
†Includes other investments.

The annual report of the Northern Pipe Line Co. for 1922 shows net income of $482,167 after deducting depreciation and taxes, equivalent to $12.05 per share earned on the $4,000,000 capital stock, as compared with $453,050, or $11.32 per share in 1921.

The statement for 1922 compares as follows:

	1922	1921
Net income	$ 482,167	$453,050
Dividends	*1,000,000	400,000
Deficit	$ 517,833	$ 53,050

*Includes special dividend of $15 per share amounting to $600,000 distributed January 1, 1923, to stockholders of record December 4, 1922, all of which was paid out of earnings accumulated since March 1, 1913.

The balance sheet of the Northern Pipe Line Co. as of December 31, 1922, compares with the preceding year as follows:

Assets	1922	1921
Plant	$2,969,937	$2,941,216
Materials and supplies	44,313	51,480
Cash, etc.	4,065,804	3,904,843
Total	$7,080,054	$6,897,739
Liabilities		
Capital stock	$4,000,000	$4,000,000
*Accounts payable	1,325,886	620,249
Depreciation reserve	1,427,410	1,352,898
Surplus	326,758	924,592
Total	$7,080,054	$6,897,739

*Includes taxes and fire insurance reserves.

The controversy between the Ohio Oil Co. and the Blackstone Petroleum Co. over the operation of 260 acres in the Salt Creek Field has been amicably adjusted, and the suit in the Federal Court has been dismissed. According to Robert M. Birck, president of the Blackstone Co., the Ohio Oil Co. retains the operating contract, but releases a certain amount of production, which will give the Blackstone company a cash income of more than $5,000 per month. The remainder of the Blackstone company's share will be used for drilling expenses.

The Oklahoma Producing & Refining

(Continued on page 52)

NEW YORK STOCK EXCHANGE—LIST OF ACTIVE STOCKS

No.	Stock—	Par	Annual Dividend	Closing Quotations Feb. 27	Feb. 20	Range, 1923 High	Low
1.	Associated Oil	100	6	126	*130	134	120¼
2.	Atlantic Refining, common	100	4	142	143	160	119
3.	Barnsdall "A"	25	..	30½	31	34½	29
4.	Caddo Central Oil	..	..	*8¼	8½	9½	6¾
5.	California Petroleum, common	100	7	85½	82½	88	66¼
6.	Cosden & Co., common	..	†4	58¼	58¾	60¼	50⅝
7.	General American Tank	..	†3	*72	71⅞	71⅞	66
8.	General Asphalt	100	..	46¾	46¾	49⅞	41½
9.	Houston Oil	100	..	71½	73½	78	69¼
10.	Indiahoma Refining	25	..	*15	*15⅝	16	13
11.	Indian Refining	10	..	*7	*7	7⅛	7
12.	Invincible Oil	50	..	17	17½	17⅝	14¼
13.	Island Oil & Transport	10	..	½	½	½	¼
14.	Kansas & Gulf	10	..	2¼	2	3⅛	1⅛
15.	Marland Oil	..	†4	40½	41⅞	41	27¼
16.	Mexican Seaboard	..	6	17⅝	18⅝	19½	16¼
17.	Middle States Oil	10	12	11½	11½	12¼	11
18.	Oklahoma Producing & Refining	5	†2	2⅝	2⅝	3⅛	1⅞
19.	Pacific Oil	..	†2	44⅝	45⅞	48⅞	42¼
20.	Pan-American, common	50	16	79¼	81¼	93½	78¼
21.	Pan-American "B"	50	16	70⅝	72	86	69⅝
22.	Panhandle Producing & Refining	..	..	*4½	*4½	4⅞	4
23.	Phillips Petroleum	..	†2	59½	58⅝	61	47½
24.	Pierce Oil, common	25	..	5¼	5¼	6	4
25.	Producers & Refiners	50	8	53½	51¼	54½	47¼
26.	Pure Oil Co., common	25	9	29½	30½	32	27¼
27.	Royal Dutch, N. Y., sh	13.40	†5.20	54½	52⅝	55½	42⅝
28.	Shell Transport	10	† .74	39	39⅝	40	34⅝
29.	Shell Union, common	..	..	15⅝	15⅝	16¼	12⅝
30.	Sinclair Consolidated, common	..	†2	33¼	34¼	35⅞	31⅞
31.	Skelly Oil	10	..	12⅝	13¼	13¼	8⅝
32.	Standard of California	25	16	60⅜	60⅞	62½	54⅝
33.	Standard Oil of N. J.	25	4	42⅝	41⅝	43¼	39¼
34.	Standard of New Jersey, preferred	100	7	116⅝	117⅞	118	116⅜
35.	Superior Oil	..	..	6¼	6¼	6⅝	4⅞
36.	The Texas Co.	25	12	50⅝	52⅝	52	47⅜
37.	Texas & Pacific Coal & Oil	10	10	22⅜	23½	24⅜	20¼
38.	Tide Water Oil	100	..	136⅝	134½	138⅝	120
39.	Transcontinental	..	..	11⅝	12¼	14½	10⅞
40.	Union Tank, preferred	100	7	*112	*111⅞	114	111
41.	White Eagle Oil & Refining	..	†2½	29	29⅝	29⅝	24⅞
42.	White Oil	..	..	4⅝	5¼	5⅞	3
	Standard Oil Stocks						
43.	Anglo-American Oil	5	10	17⅞	18¼	19¾	17
44.	Borne Scrymser	100	35	135	*110	122	110
45.	Buckeye Pipe Line	50	14	88½	90	94	87½
46.	Chesebrough Manufacturing, com.	100	14	*225	*223	114	111
47.	Continental Oil	100	8	47	48¼	50	38
48.	Crescent Pipe Line	50	6	23	23	25	22
49.	Cumberland Pipe Line	100	12	*113	114	116	80
50.	Eureka Pipe Line	100	12	*111	*111	116	96
51.	Galena-Signal, common	100	4	73	68½	78	57
52.	Illinois Pipe Line	100	14	168	169	171	165
53.	Indiana Pipe Line	50	16	99⅞	97½	99	95
54.	National Transit	12.50	14	27½	29	29	25⅝
55.	New York Transit	100	12	136½	134	138	130
56.	Northern Pipe Line	100	25	*106	*108	111	105
57.	Ohio Oil Co.	25	12	82⅞	83⅝	85⅝	74
58.	Penn-Mex. Fuel	25	..	21¼	*18	24	17
59.	Prairie Oil & Gas	100	8	265	267	273	212
60.	Prairie Pipe Line	100	8	114½	115½	117	109
61.	Solar Refining Co.	100	15	212	185	203	117
62.	Southern Pipe Line	100	16	109	110	116	96
63.	South Penn Oil	100	..	*188	193	196	165
64.	South West Pa. Line	100	7	*80	*108	85	66
65.	Standard of Indiana	25	10	66⅞	66⅝	67½	59⅞
66.	Standard of Kansas	25	8	53⅝	55½	56	41½
67.	Standard of Kentucky	25	10	104⅝	107	109½	76
68.	Standard of Nebraska	100	20	273	235	280	186
69.	Standard Oil of N. Y.	25	16.8	47½	47	49⅝	45½
70.	Standard of Ohio, common	100	16	*295	*302	309	272
71.	Swan & Finch	100	..	*30	*32	38	21½
72.	Vacuum Oil	25	16	52½	51	55½	43¾
73.	Washington Oil	10	20	*25	*26	27	25
	Miscellaneous Stocks						
74.	Cities Service, banker's shares	..	‡21	19	19⅛	18⅛	17⅝
75.	Gulf Oil Corporation of Pa.	25	6	65½	67½	68	54½
76.	‖Humble Oil & Refining	25	8	37½	37⅝	38⅝	33
77.	‖Imperial Oil (Ltd.)	25	16	119½	118¼	122	110½
78.	‖International Petroleum (Ltd.)	..	x50	23⅝	23	24⅝	20
79.	‖Magnolia Petroleum	100	4	161⅝	163	166	155
80.	Mammoth Oil "A"	..	..	51	52	53	47¼

*Bid, no sales. †In dollars. ‡6 per cent in cash and 15 per cent stock dividend declared; now being paid in scrip. ‖Quotations furnished by Carl H. Pforzheimer & Co. xCents per share.

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange weekly was as follows:

Feb. 27	$59.67	Jan. 16	$58.49	December 5	$58.01
Feb. 20	59.92	Jan. 9	58.82	November 28	57.12
Feb. 13	59.37	Jan. 2	60.10	November 21	56.69
Feb. 6	61.10	December 26	59.20	November 14	56.22
Jan. 30	57.91	December 19	57.36	November 6	60.00
Jan. 23	58.85	December 13	56.33	October 31	58.00

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From *Factory*, November, 1922

From *The Saturday Evening Post*, November 4, 1922

HOW long your fence lasts depends upon whether it is merely a fence or a *Page-Protection Fence* made of rust-resisting "Armco" Ingot Iron. "Armco" Ingot Iron is commercially pure iron. It not only resists rust, but its smooth, even surface makes a close bond with the galvanizing, which will not crack or peel.

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Petroleum Equipment Activities

An effort is being made by several supply concerns in Tulsa to standardize rental tool list prices and merchandizing practices. It is felt that the interests of all will be served if this uniformity in price can be brought about. The plan, if carried out, will also simplify the situation for the users.

M. C. Shupert, sales manager of the Oklahoma Tool & Supply Co., which in a large measure has sponsored the movement, sent out the following letter to supply companies renting tools and has received many favorable replies:

"As there has been a general demand among the oil men and purchasing agents of the oil industry for standardization, why couldn't the oil well supply companies and fishing tool companies standardize on a set list price on rentals? After establishing a list price on the different tools then publish a retail discount applicable to all lists. Of course, every company would have a certain preferential discount beyond the set retail discount.

"The writer would suggest that all companies interested in this proposition submit a letter as to their option in this matter."

ELECTRICAL PUMPING DEVICE IS OPERATED SATISFACTORILY

BRADFORD, Pa., Feb. 24.—An electrically driven pumping head for use on an oil well has been installed on a well owned by L. W. Oakes and located on a lease near this city. The equipment is the invention of Raymond J. Cole and is protected by patents. It is claimed for the equipment that it materially reduces operating costs and that many wells can be operated at approximately $5 a month each. The first test attracted the attention of several oil men operating in this section. Additional tests are to be made later.

The pumping head casting is attached to the top of the well casing by means of clamps and supported by steel rods which also serve to keep the alignment and to give rigidity to the frame. The casting, which encloses the mechanism, consists of a hollow open-ended cylindrical case through the vertical ends of which the pump rod operates. The pump rod is surrounded by a toothed member, which by means of rotating movement, drives the mechanism that raises and lowers the pump rod. A special feature is the reversing arrangement which automatically changes the direction of the movement of the pump rod.

Another attachment is the underload coil which provides an automatic stop arrangement for the well when it is pumped off. The present model contains a 2 h.p. alternating current type induction motor. In spite of the weight of the rods in the well which was drilled to a depth of 1,140 feet, the new invention was operated in a satisfactory manner.

TOOLS USED TO DRILL FIRST WELL IN MID-CONTINENT SHOWN

One of the oldest sets of drilling tools known is now on exhibition at the permanent industrial exhibit of the Tulsa Purchasing Agents Association at Tulsa. The tools are said to have been manufactured in Pennsylvania in the 60s. They were shipped to Kansas about 1880 and are said to have been used in drilling the first well of the Mid-Continent area near Neodesha, Kans., in 1883.

The tools have attracted considerable attention, especially among old-time drillers. Although minor changes have been made, the tools are proof of the statement often made that drilling equipment is unique in that very few improvements of a fundamental nature have been made since their first use. The exhibition was made possible through the courtesy of Wilson & Willard Co. and Henry Rosenthall, of Wichita, Kans.

CAPTAIN LUCEY OPTIMISTIC

NEW YORK, Feb. 24.—The outlook for the oil well equipment business in the Mid-Continent area is very favorable, according to Capt. J. F. Lucey, who arrived here recently after a visit to the oil fields of the Southwest. Captain Lucey said that the recent advances in the price of crude oil had already increased operations in the oil fields and this situation had been reflected in the demand for supplies and equipment. He predicted a prosperous year for the oil industry generally. The statement was made just previous to Captain Lucey's leaving for a trip abroad.

BUYS COOPER ENGINES

The United Fuel Gas Co. at Charleston, W. Va., has purchased two 975 B.H.P. gas engines from the C. & G. Cooper Co. at Mt. Vernon, Ohio. In this natural gas system, practically every make of gas engine is used in the numerous compressor stations. When these last two engines are installed, there will be a total of thirty 340 h.p. Cooper engines alone, which includes 60 of the Cooper standard 485 B.H.P. units. This indicates the large investments required for pumping machinery in addition to the miles of pipe line and other expensive equipment which is necessary before natural gas can be delivered to the consumers.

LARGE TANK CAR ORDER

The Bolene Refining Co. during the past week placed an order for 30 new 8,000-gallon tank cars with the Petroleum Iron Works of Sharon, Pa. The cars will be delivered at the refinery of the Bolene company located at Enid, Okla. Several large orders have been placed recently with the Petroleum Iron Works for equipment. Included in these orders are twenty-five 80,000-bbl. tanks for The Texas Co. and a large number of stills for the Sinclair Refining Co. The latter are for the refinery which the Sinclair company is erecting at Marcus Hook.

FOAMITE-CHILDS CORPORATION HOLDS SALES MEETING

The first annual sales convention of the Foamite-Childs Corporation was held at Utica, N. Y., February 19 and 20. The meetings were held at the Hotel Utica and at the factory of the corporation located in that city. The convention combined pleasure and business and was largely attended by the sales representatives of the company.

Several talks were made at the business sessions on the practical use of the Foamite-Childs products. A. O. Boniface, insurance and service engineer, spoke on "The 'Why' of Portable Chemical Apparatus," and W. D. Witter, chief engineer, on "Foamite Systems for Indoor and Outdoor Hazards." Other talks included "Fire Gun or Pyrene," H. E. Tunnell; "Selling the Fire Gun to National Buyers," H. L. Huelings; "The Elements of a Sound Advertising Plan," L. W. Baillie of the J. Walter Thompson Co., New York, and "Selling Fire Protection Service," E. E. O'Neil, sales manager, Fire Equipment & Marine Supply Co., Cleveland, Ohio.

The salesmen were welcomed to the convention by W J. Childs, president of the corporation. F. M. Watters, vice president and general manager, spoke on the subject, "Our Company." J. C. Patterson, director of sales, had charge of arrangements for the convention.

OPENS NEW BRANCH

The Bridgeport Machine Co. of Wichita, Kans., has opened a new branch at Madison, Kans., due to the rapid increase in activity in Greenwood County. Madison is located in the heart of the field. There are nine oil well supply stores in Madison. With the Madison branch, the Bridgeport company now has 15 stores located in various sections of the Mid-Continent Field.

CATALOG SHOWS "ADS"

The General American Tank Car Corporation and affiliated companies, with general offices in Chicago, have issued a catalog to their stockholders and friends. The catalog contains full page reproductions of advertisements which the company carries in several publications. The company reports a strong demand for the tank cars manufactured by the company. A full page is devoted to the insulated cars manufactured and used in the transportation of natural gasolines.

TO OPEN TULSA BRANCH

The O'Brien Steel Construction Co. of Washington, Pa., will shortly open a branch at Tulsa, Okla. The branch store will have a completed stock of steel drilling and pumping derricks such as the company has manufactured and sold in Eastern fields for the past seven years. R. L. O.'Brien was in Tulsa last week making arrangements to open the headquarters for the Mid-Continent area.

PAINT REDUCES EVAPORATION

The St. Louis Surface & Paint Co. is placing on the market an aluminum paint. The paint has unusual heat deflectory properties which reduce evaporation losses. William T. Deacon and Andrew W. Deacon were recently elected vice presidents of the company. The brothers are in charge of refinery sales.

ELECTED A COUNCILMAN

George B. Eyssen, credit manager of the National Supply Co., was elected councilman from the Tenth Ward of Toledo, Ohio, during the past week. Mr. Eyssen has resided in the Tenth Ward of Toledo for the past 15 years and has had valuable legislative experience, having for six years been a member of the school board at Marietta, Ohio, and for two years a councilman at Independence, Kans.

TO ERECT REFINERY

HOUSTON, Tex., Feb. 24.—The O. W. Killiam interests announce that a refinery of 2,000 bbls. capacity will be built at Mirando City, Tex. They expect to have it in operation by July 1. Construction work will start at once.

C. A. GREEN ASSUMES DUTIES

C. A. Green recently assumed his duties as manager of the Shreveport area for the Williamsport Wire Rope Distributing Co. with headquarters at Shreveport, La. Mr. Green is widely known among supply men. H. E. Mitchell has also been employed by the Williamsport organization with headquarters at Wichita, Kans. M. J. Lowe, Jr., has been placed in charge of the branch at Shidler, Okla. He is son of M. J. Lowe, widely known in Eastern oil fields.

LARGE SUCKER ROD ORDER

The Phillips Petroleum Co., through A. C. Branson, recently placed another order for 250.000 feet of Axelson sucker rods. The order was placed with the Frick-Reid Supply Co., exclusive agents for the rods. The order was the second of similar size placed by the Phillips company. It was the sixth 250,000-foot order which has been placed for the Axelson sucker rods during the past few months.

HASKELL INTERESTS WANT RICH WYOMING OIL LAND

CASPER, Wyo., Feb. 24.—The Haskell interests, who propose to build a railroad from Casper to the Chicago, Milwaukee & St. Paul Railway in Montana have asked for Section 33-40-79 in the Salt Creek Feld as a requisite for the building of the road. This section is probably the richest square mile of oil land in the country and is owned by the State of Wyoming. It has produced millions of barrels of crude and has not yet reached its peak of production or development. The Midwest Refining Co. has the lease at present and has operated the section since the firm took over the old Reed interests. The lease will be out in October, 1924. The consensus of opinion among the oil men appears to be that the State could take a part of the income from this section and build the railroad itself.

FOUR COMPANIES CITED

WASHINGTON, D. C., Feb. 23.—Misrepresentation in the advertisement and sale of oil stock is alleged in a complaint issued by the Federal Trade Commission against four oil companies of Fort Worth, Texas.

According to the citation, the respondents caused to be circulated statements to the effect that the four companies were on a dividend paying basis, whereas it is alleged that at no time was either company in such a financial condition as to warrant the payment of dividends. Other misrepresentations concerned the alleged ownership of oil producing wells and claims of acreage for oil and gas leases far in excess of that actually owned by respondents.

The companies and sole trustees named in the citation, who will be given 30 days in which to answer before the case comes to trial, are: Texas-Mexia Drilling Syndicate, B. M. Hatfield; Sterling Syndicate, J. D. Johnson; Old Timers Oil Pool, Albert S. Leach; Co-Operative Oil Interests, C. R. Farmer.

GASOLINE'S HIGH PLACE

WASHINGTON, Feb. 26.—The 5,006,056,700 gallons of gasoline produced in 1921 had a value of $840,672,300, or nearly half the value of all petroleum products in that year, showing an increase over 1919 of 23.7 per cent in value and 39.7 per cent in quantity.

Whitlock Manila Cables Are Dependable

IN these days when drilling costs must be held down to the last dollar, wise American operators are using Whitlock Cables in ever increasing numbers, for Whitlock gives greatest service at reasonable price. It drills ahead and lasts longer.

Each Whitlock Cable bears a positive guarantee of satisfaction. This guarantee is possible because these cables are made only from very high grade, selected Manila fibre by skilled workmen of long experience. Drillers take no chance when they purchase Whitlock.

WHITLOCK CORDAGE
THE UTMOST IN ROPE VALUE

Drop into a Frick-Reid or Frick & Lindsay Co. store and ask for further proof that Whitlock Cables will save money for you. These stores can furnish complete drilling rigs, including bull ropes, sand lines and calf ropes.

WHITLOCK CORDAGE COMPANY
46 South Street, New York

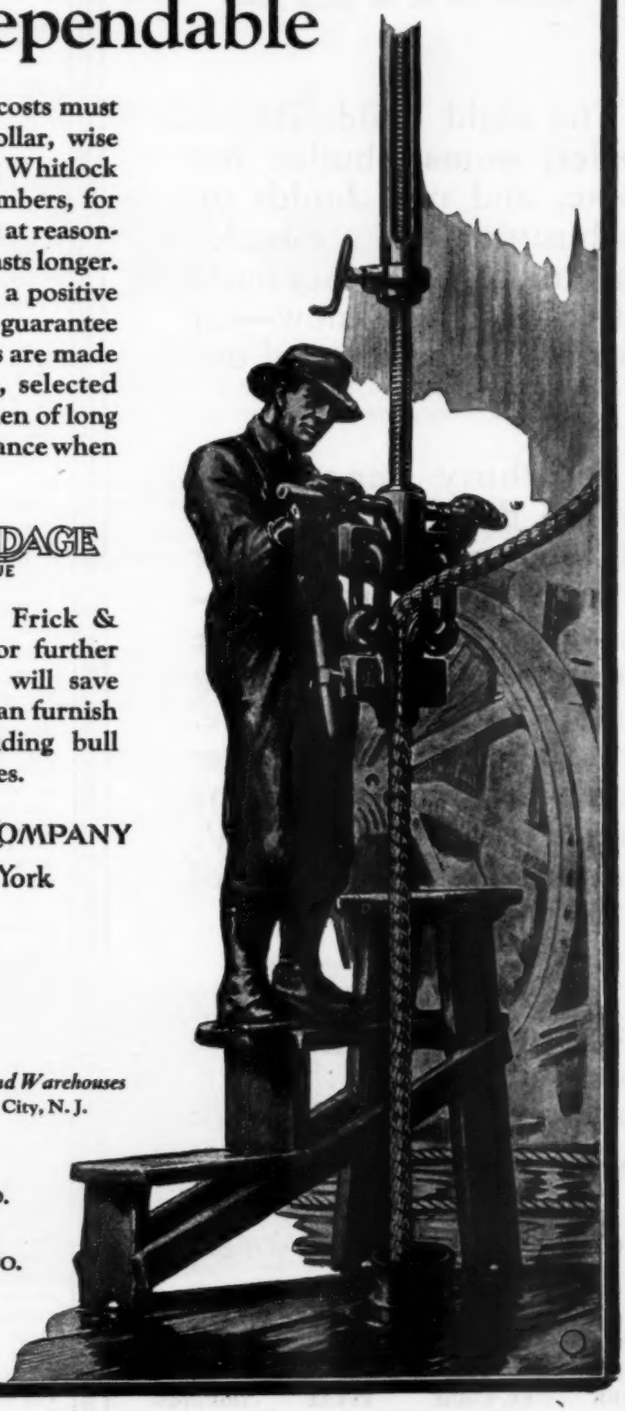
WHITLOCK The Utmost in Rope Value MANILA

Branches
Boston, Kansas City, Chicago and Houston

Factory and Warehouses
Jersey City, N. J.

Eastern Distributors: FRICK & LINDSAY CO.
Pittsburgh, Pa., and branches

Western Distributors: FRICK-REID SUPPLY CO.
Tulsa, Oklahoma and branches



P.I.W.
STEEL PLATE CONSTRUCTION

This Business of Building

The child builds its air castles; woman builds her home; and man builds up his business—all are builders. And together they build better than they know—for they are the builders of our Civilization.

For thirty years "The TANK BUILDERS" have built steel plate products for America's oil industry—stalwart products that come through under the exacting tests of rigorous service. And they, too, build better than they know—for the service records of P. I. W. Products are the builders of Good Will.

So we continue our daily tasks with a more generous understanding of this far-reaching business of building.

"The TANK BUILDERS Build 'em Right"

THE PETROLEUM IRON WORKS COMPANY
Sharon, Pennsylvania
NEW YORK ST. LOUIS TULSA HOUSTON
TAMPICO CASPER SAN FRANCISCO

P. I. W. Steel Plate Products Are Used in the Petroleum, Gas, Mining, Railway, Iron and Steel Waterworks, Engineering and Allied Industries

OIL PRICE INCREASES BOLSTER SECURITIES

(Continued from page 48)

Corp. of America, a subsidiary of Pure Oil Co., has issued its annual financial statement for 1922. It shows net income available for surplus and reserves of $1,159,282, after providing for taxes and interest. This compares with $1,126,653 in 1921, when the company made an additional charge of $2,482,414 for depletion and depreciation, making a deficit of $1,355,761 for that year. The income account for 1922 compares as follows:

	1922	1921
Gross earnings	$6,081,462	$5,928,894
Expenses, etc.	4,662,798	4,605,528
Net earnings	$1,418,664	$1,323,366
Interest and taxes	259,382	196,713
Depletion and depreciation		2,482,414
Net income	$1,159,282	*$1,355,761
Preferred dividends		60,000
Common dividends		430,820
Surplus	$1,159,282	*$1,846,581
P. & L. deficit	252,133	1,374,979

*Deficit.

The consolidated balance sheet of the Oklahoma Producing & Refining Co. as of December 31, 199, compares as follows:

Assets

	1922	1921
Property, plant, etc.	$35,443,995	$21,978,622
Cash	145,890	248,775
Accounts and notes receivable	517,150	483,921
Finished oil stocks	158,784	192,933
Crude oil stocks, etc.	122,346	360,539
Materials & supplies	633,800	567,418
Deferred charges	188,275	68,404
Total	$37,240,240	$23,900,612

Liabilities

Common stock	$21,541,000	$21,541,000
Preferred stock	3,000,000	3,000,000
Accounts and notes payable	610,513	635,659
Purchase money obligations	4,225,000	
Accrued taxes, etc.	54,537	46,618
Insurance reserve	10,000	52,314
Depletion and depreciation reserve	8,051,323	
Deficit	252,133	1,347,979
Total	$37,240,240	$23,900,612

The annual report of the Union Oil Co. of California, for the year ended December 31, 1922, shows net profit of $10,735,875 after charges, Federal taxes, etc., equivalent to $21.47 per share earned on the $50,000,000 capital stock, as compared with $10,582,207, or $21.05 per share earned in 1921.

The consolidated income account of the Union Oil Co. of California, and owned companies for 1922, compares as follows:

	1922	1921
Profit	$25,419,981	$23,839,187
Expenses, taxes, etc.	3,141,023	3,026,932
Net earnings	$22,278,958	$20,812,255
Interest	429,353	3,249
Depreciation, depletion, etc.	10,563,730	8,630,799
Fed. taxes, etc.	550,000	1,650,000
Net profit	$10,735,875	$10,528,207

Crude oil production of the Union Oil Co. of California, during 1922, was 12,453,846 bbls., compared with 10,217,865 bbls. in the preceding year.

The White Eagle Oil & Refining Co. for the year ended December 31, 1922, reports net income of $1,892,938 after charges, Federal taxes, depreciation, depletion, etc., equivalent to $4.73 per share earned on the 400,000 shares of outstanding no par capital stock. This compares with $790,608, or $2.69 per share, earned on 294,042 outstanding shares in 1921.

The income account of the White Eagle Oil & Refining Co. for 1922, compares as follows:

	1922	1921
Sales	$13,834,818	$ 9,251,382
Cost of sales	9,036,343	6,615,343
Gross profits	$ 4,798,475	$ 2,636,039
General expenses, etc.	1,467,808	1,016,740
Operating profits	$ 3,330,667	$ 1,619,299
Other deductions	278,628	61,881
Federal taxes	192,000	29,000
Depreciation and depletion	967,101	737,810
Net income	$ 1,892,938	$ 790,608

LAST MINUTE *from* OKLAHOMA

The Comar Oil Co.'s No. 4 Blubaugh, SW cor. Section 2-24-1w, in Tonkawa, was making 80 bbls. an hour in sand at 2,032-85 feet, and was still drilling. The same company's No. 1-A Blubaugh, NW cor. SW, Section 2-24-1w, was good for 100 bbls. an hour initial, getting top of the sand at 2,489 feet, first gas at 2,520 feet and pay at 2,525-50 feet. The same company's No. 1-B L. Endicott, SW cor. NW SW, Section 35-25-1w, was making 25,000,000 feet of gas and spraying oil in sand at 1,958-67 feet. The same company's No. 5 Carmichael, SE cor. NE, Section 3-24-1w, got the top of the sand at 2,016 feet and at 2,038 feet the well was flowing. No gauge was taken and drilling was continued. The Comar Oil Co.'s No. 5 Blubaugh, NE cor. NW SW, Section 2-24-1w, was drilling at 2,501 feet, after making several flows. Top of the sand was found at 2,489 feet. McCaskey & Wentz were completing No. 2 McKee, SE cor. SW, Section 34-25-1w.

McCaskey & Wentz deepened No. 10 McKee, NW cor. NE SW, Section 34-25-1w, Tonkawa Field, to a total depth of 1,997 feet and it gauged 275 bbls. in two hours.

The Wolf Oil Corporation's No. 1 Seay, SW cor. NW NW, Section 36-16-9, Creek County, made 430 bbls. in sand at 2,907-20 feet. The Aztec Oil Co.'s No. 3 White, SW cor. SE NW, Section 11-14-8, was good for 100 bbls. after a 180-quart shot in sand at 2,452-92 feet. The same company's No. 4 White, NW cor. SE NW, same section, made 200 bbls. after a 210-quart shot in sand at 2,437-2,507 feet.

The Cosden Oil & Gas Co.'s No. 1 Bruner, NE cor. SW, Section 21-10-9, Okfuskee County, was dry at 3,162 feet.

The Dunn Drilling Co. completed No. 4 Wright, CSL SE SW, Section 22-14-14, Okmulgee County, as an 800-bbl. well after an 80-quart shot in sand at 1,771-1,810 feet. Smith and others had a 125-bbl. show at 1,500-03 feet in No. 8 Field, NW cor. NW SW, Section 18-14-15, an old well drilling deeper.

In Carter County, Merrick and others' No. 1 Sparks, C SE SW SW, Section 30-2s-3w, made 390 bbls. the first 24 hours in broken sand at 2,361-2,453 feet. The Kirk Oil Co.'s No. 3 Bennett, CNL NW NE, Section 31-2s-2w, was good for 175 bbls. in broken sands at 2,130-2,569 feet. Coline & Galt's No. 1 Paulson, SW cor. NE NE, Section 4-4s-2w, was dry at 3,281 feet.

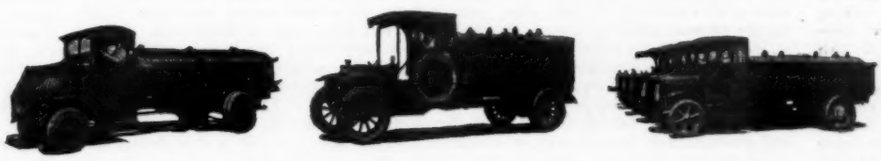
The Watchorn Oil & Gas Co.'s No. 25 Townsend, SW cor. SE NE, Section 5-22-4, Marion County, Kansas, made 150 bbls. naturally in sand at 2,379-84 feet. The same company's No. 26 Townsend, CEL NE SE, same section, was good for 175 bbls., sand at 2,380-86 feet.

In Butler County, Kansas, the Empire Gas & Fuel Co. and the Phillips Petroleum Co.'s No. 1 Paulson, SW cor. SW NW, Section 1-24-4, made 200 bbls. naturally, sand at 2,436-40 feet. The Phillips Petroleum Co.'s No. 1 Edwards, CNL NE SE, Section 12-24-4, was estimated at 10 bbls. oil with considerable water, sand at 2,438-72 feet. Haver & McGinnis' No. 1 Hoover, NW cor. Section 28-24-9, was dry at 2,495 feet.

In Greenwood County, Kansas, Polhamus and others' No. 4 Marshall, SE cor. SW SW, Section 34-24-9, made 125 bbls. from sand at 2,273-91 feet. The Mid-Kansas Oil & Gas Co.'s No. 3 Dibert, NE cor. NW NW, Section 3-25-9, made 200 bbls. at 2,226-2,301 feet. Polhamus completed a 200-bbl. well in sand at 2,219-2,300 feet at No. 1 Dibert, SW cor. SW NW, Section 3-25-9. The Pixlee Petroleum Co.'s No. 2 Pixlee, C NW SW SW, Section 5-22-10, flowed 45 bbls. in 12 hours, sand 2,290-2,317 feet. Waite Phillips' No. 1 Pixlee, C NW NW NW, Section 8-22-10, was good for 100 bbls. after a 100-quart shot in pay from 2,335-2,383 feet.

Vogt AUTO TRUCK Tanks

Are Riveted



The jolting and vibration to which Auto Truck Tanks are often subjected require joints that will withstand severe strains. Leaks occur in improperly designed joints, and are the source of trouble. These faults are overcome in the Vogt Riveted Joints.

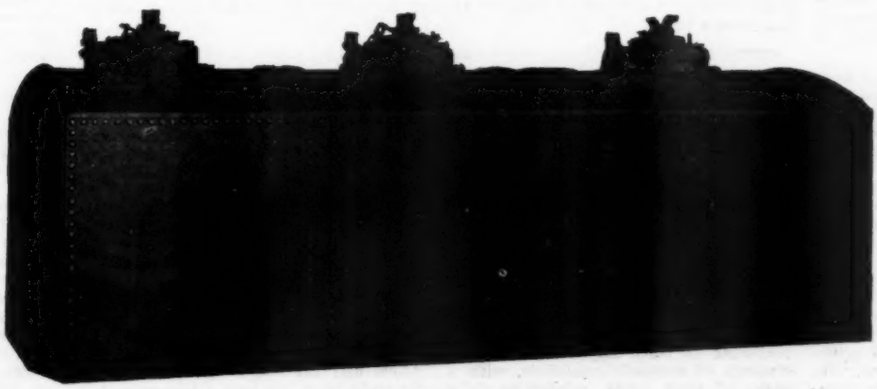
The Vogt Tanks are of oval and semi-rectangular shapes with capacity of 250 to 1500 gallons. The safety arrangement for each compartment, together with our improved emergency valves and manholes, complete a design to give the utmost efficient service. Many oil companies and distributors thruout this country use the Vogt Auto Truck Tank because of these service-giving features, and the strength of its riveted construction.

Each tank is tested under water pressure and is thoroughly inspected and approved by trained inspectors. Complete details and specifications will be sent upon request.

HENRY VOGT MACHINE CO.
Incorporated
LOUISVILLE, KY.

BRANCH OFFICES:
NEW YORK CHICAGO
TULSA, OKLAHOMA

MANUFACTURERS OF OIL REFINERY EQUIPMENT, DROP FORGED STEEL VALVES AND FITTINGS, WATER TUBE AND HORIZONTAL RETURN TUBULAR BOILERS AND REFRIGERATING MACHINERY



VOGT AUTO TRUCK TANK

Optimism Pervades Group 3 Oil Market

Fear of "Big Squeeze" in 1923 Passing From Minds of Refiners as Tank Wagon Advances Without Further Crude Price Increases.

By J. B. Gambrell

While there has been very little change in the Mid-Continent refined oil structure during the past week, further advances in tank wagons in the Kentucky, New York and Magnolia territories, coupled with the fact that for the first time in six weeks the Prairie Oil & Gas Co. failed to advance crude, has created a strong undercurrent of optimism in the refinery market of this territory, and apparently the larger Mid-Continent refiners feel that they have definitely turned the corner in so far as the gasoline season of 1923 is concerned. At least this is the impression one gathers in talking to the executives of the major independent refining organizations of this territory.

It may be that part of this feeling of optimism is merely psychological and attributable to the arrival of the first of March and spring, with the wish being father to the thought that March will bring the customary heavy spring buying, but it has a more substantial foundation than this. In reality, it is due to the removal from refiners' minds of a fear which has possessed the majority of refiners in this territory that 1923 was to be known as the year of the big squeeze.

In other words, to put it bluntly, while most of the refiners in the Mid-Continent Field have, during the past 90 days, been willing to discuss in glowing terms the optimistic outlook for 1923 from the point of gasoline consumption, many of them, though unwilling to admit it, have firmly believed that the dominating factors of the industry planned to run the price of crude up and hold the tank wagon down with a view to forcing independent refiners of the Mid-Continent Field to relinquish a large portion of their light crude which it is commonly understood is badly needed by some of the major organizations.

Independents Have Grown

Exponents of this line of reasoning have cited in substantiation of their theory the enormous growth of the independent refining industry in Oklahoma, Kansas, north Texas, north Louisiana and Arkansas during the past year and pointed out that through this expansion, refineries of this area were now charging through their stills approximately 100,000 bbls. more of crude oil than 12 months ago.

It has been nothing unusual to hear in refining circles during the past few months the charge made by men ordinarily well informed that the big interests were out to get the small independent refiner. Such opinions and talk invariably develop when crude, refinery and tank wagon markets are in a transitory condition. There is always a certain element which sees in such periods a sinister policy behind each action of the big price makers. Unfortunately, this element has won many converts during the past two months or so on account of the raw material market advancing so much more rapidly than the retail price.

Apparently, however, the recent advances in tank wagons in various parts of the country ranging from 1 to 2 cents are rapidly disabusing the minds of those pessimistically inclined of the existence of such a menace, and refiners on the whole are beginning to believe that the next 30 days will witness the re-establishment of the proper price relationship between crude and tank wagons. Of course, the Standard of Indiana tank wagon is still out of line with refinery gasoline prices, but in view of the fact that the Standard of New Jersey, the parent organization, has made three separate and distinct increases, the feeling prevails that it is only a matter of days until another upward revision will be made in the middle western area in which the bulk of Mid-Continent products are marketed.

Consumption Increasing

In this connection, it is rather remarkable what a tremendous revulsion of feeling there has been in certain quarters over the outlook for petroleum and its products. Sixty days ago when it became obvious that crude prices were preparing to move forward many close students of economic conditions, with a shake of their heads, pointed to daily production at that time and declared that the marking up of the price of raw material was premature and would inevitably lead to a reaction. While a few of these economists still express a doubt as to the healthiness of the present situation, the majority of them have come to the conclusion that the oil business along with all other basic industries is on the verge of another period of inflation which may possibly carry through the entire year of 1923. It is estimated by several of the larger concerns who wield a protective wand over the industry, that to meet this year's indicated consumption will require a domestic production of at least 2,000,000 bbls. daily or an increase of approximately 250,000 bbls. a day over the present output.

It is this angle in the situation which constitutes the sole remaining fly in the refining ointment of this territory. "Where is crude going to in the Mid-Continent Field during the next few months?" is the question that every independent refiner is asking himself who does not own or control his production. Apparently the end is not yet in sight for while there has been a temporary lull in the past 10 days in price advances, this is looked upon more in the light of a breathing spell. Certainly competition is growing keener and all signs point to the future developing one of the most titantic struggles the industry in this area has experienced since the days of $3.50 crude.

Take, for example, the more recent developments in the Tonkawa Field. This field, which is the only light oil area in the Mid-Continent Field which is showing a consistent increase in daily output, is now producing in the neighborhood of 70,000 bbls. daily of high gravity crude and predictions are made that it will pass the 100,000-bbl. mark within a short time. Despite this tremendous flush production, premiums have during the past week made their appearance in this field. Several concerns are known to have made contracts on what is understood to be a 25-cent premium over the present posted price of $2.60, and while the Champlin Refining Co., Moore Refining Co., Bolene Refining Co., Producers & Refiners Corporation, Roxana Petroleum Corporation, Kay County Gas Co., Sinclair Pipe Line Co., Globe Oil & Refining Co., Cosden Pipe Line Co., Gulf Pipe Line Co. and Prairie Pipe Line Co. are already in the field or have lines under construction, a number of other companies, among which is The Texas Co., are reliably understood to be contemplating entering this field.

Premiums Becoming General

The same situation exists to a less degree in practically every other light oil field of Oklahoma and even in such districts as Hewitt, where the crude is of relatively low gravity, premiums of 50 cents are being paid by independent refiners. Such a condition, it is conceded, will lead to further advances by the dominant factors, as obviously if the independent plants can afford to pay these premiums the large pipe line organizations will feel justified in increasing the posted price.

In the meantime, refiners are praying that further advances in crude will be postponed until the Indiana tank wagon is advanced in keeping with present raw material costs. In an effort to protect themselves against crude going up before another increase in the tank wagon, a number of refiners are refusing to quote New Navy gasoline over any period unless such a price carries a certain per cent of any advance in crude with a similar provision in regard to the tank wagon. On the other hand, while the general disposition among sales managers is to deal on a spot basis only, a few of the more courageous are willing to take a chance on a flat price of 15 cents over the month of March, but apparently are not eager to make any large sales at this figure.

Gasoline and Naphtha

There is a great deal of talk about cheap spot gasoline, but when one endeavors to purchase a large quantity of strictly New Navy, it is surprising how little comparatively there is available. There are about 100 cars of treated and untreated New Navy in the present spot market, but this is mostly stuff that was bought in advance by marketers who are endeavoring to sell it below the general market structure on account of the first of the month and the remainder is coming from the smaller plants whose storage and finances force them to sell their output currently regardless of price.

One or two of the larger concerns who are well fortified with money in storage, have notified the smaller plants that if they were forced to sell their gasoline below the big companies' quotations they would take it off their hands and apply it on their contracts, storing thier own output, and some few of the smaller concerns are understood to have taken advantage of this offer.

The export market is very quiet. The Union Petroleum Co. is buying a little 64-66, but the price it has been able to

(Continued on page 68)

REFINED MARKET BAROMETER

Refinery markets throughout the country are showing an undertone of optimism. Tank wagon advances in different trade territories have given refiners and jobbers a larger operating spread and buying should be stimulated. For the first time in weeks, there have been no crude adjustments to disrupt prices and refiners are hoping to develop a stable market with the arrival of spring. While bad weather in the principal consuming centers has retarded sales to some extent, prices of all refined products, with the exception of kerosene, have strengthened and veteran marketers believe the market has turned the corner.

The outstanding feature of the Mid-Continent market during the past week has been the final adjudication of fuel oil contracts with the Southwestern carriers. The Santa Fe Railroad, the largest consumer of Mid-Continent fuel, had adjusted its contract with Cosden & Co. and other large refiners on a basis which nets them $1.20 on the present price of crude. Gasoline is developing a more healthy tone. There is still a small quantity of cheap material, but apparently the larger independent interests have the situation well in hand and are maintaining prices. Stocks in a few cases are heavy, but this gasoline is in the tanks of refiners who are able to carry it over to the summer season.

There is little change in the North Texas market situation. High prices of crude and comparatively low quotations on refined products have resulted in shut downs and the curtailment of runs. General tank wagon advances have caused many refiners to increase their gasoline quotations, but they are still below production costs. Stocks are rapidly accumulating, forcing refiners in a few cases, to dispose of surplus at prices below those generally quoted. Most of this class of material, however, is now taken off the market and prices are firmer.

Tank wagon advances in Atlantic Refining Co. and Standard Oil Co. of New Jersey territory during the past week have given a brighter outlook to Pennsylvania market conditions. Zero temperatures and snowstorms have, however, reduced current demands to a minimum. In spite of this condition, prices remain firm with the trade anticipating a strong demand in the near future.

Unfavorable weather and advances in quotations by refiners who are endeavoring to obtain prices for their products in line with the cost of their crude supplies have resulted in a continued dearth of orders in the Chicago district. Refiners are asking 15 to 15¼ cents for New Navy, with corresponding increases in other straight run products. Kerosene continues weak, with plenty available at present quotations. Fuel oil quotations have been advanced 5 cents with a brisk demand for gas oil.

Gasoline tank wagon advances Standards New York and New Jersey and Atlantic Refining Co. territories have strengthened eastern gasoline markets. The upward trend of the gasoline market is said to be due not only to higher crude prices, but also to low stocks. Lubricants are firm. Little demand for kerosene except for export. Heavy wax exports.

Fuel and gas oils are strong in North Louisiana and Arkansas. The former is selling at $1.10 and the latter at 3¼ cents. Heavy rains for three days resulted in a minimum current demand for gasolines. Market conditions in regard to gasoline show little change over the previous week.

Jobbers in the Standard of Louisiana territory, with the constantly mounting refinery quotations are losing money under present tank wagons. The Public Service Commission has taken the matter up with the LaFollette committee and charges that independent distributors are being driven out of business. Bunker fuel has been advanced in the New Orleans district 5 cents per barrel by the Mexican Ptroleum Corporation. Exports were routine.

Conditions are unchanged in the Gulf Coast refining district. Retail gasoline prices have been advanced 1 cent, but refinery quotations on lubs and fuel oil are at last week's level.

THE GLOBE OIL AND REFINING CO.

Announces the Establishment

of its

SALES DEPARTMENT

at

303-304 Atlas Life Building

Tulsa, Oklahoma

with

A. E. LANDSITTEL

as

Manager of Sales

WE SPECIALIZE IN THE MANUFACTURE OF THE FOLLOWING PRODUCTS:

64-66 Gasoline under 375 end point
60-62 Gasoline under 400 end point
48-50 Naphtha under 440 end point
42-44 W. W. Kerosene
Gas Oil Fuel Oil

Direct All Inquiries to the Tulsa Office

THE GLOBE OIL AND REFINING CO.

I. A. O'SHAUGHNESSY, Pres. CARL B. HAUN, Vice-Pres.

BLACKWELL, OKLAHOMA

REFINERY AND CRUDE PRICES

Quotations on Principal Refined Products and Crude Petroleum Markets in All the American Oil Fields

GASOLINE AND NAPHTHA

CHICAGO DIST. (Based on Group 3)—	Feb. 27		Feb. 20		Feb. 13	
50-52 450 end point (Naphtha)	.13	.13½	.12¼	.12½	.12¼	.12½
56-58 450 end point	.14	.14½	.13¼	.13½	.13¼	.13½
58-60 437 end point (New Navy)	.14½	.15	.13½	.14½	.13½	.14
60-62 400 end point	.16½	.16¾	.15½	.16	.15½	.15¾
64-66 375 end point	.16½	.17	.16½	.17	.16½	.16¾
68-70 360 end point	.18	.18½	.18	.18½	.18½	.18¾
OKLAHOMA (Group 3)—						
50-52 450 end point (Naphtha)	.13½	.14	.13¼	.13½	.12½	.12¾
56-58 450 end point	.13½	.14	.13½	.14	.13¼	.13½
56-58 437 end point (New Navy)	.13¾	.14	.13¾	.14	.13½	.13¾
58-60 437 end point (New Navy)	.14½	.15	.14½	.15	.13¾	.14
60-62 400 end point	.15½	.16	.15½	.16	.15	.15½
64-66 375 end point	.16½	.16¾	.16¼	.16½	.16	.16¼
68-70 350-365 end point	.17½	.18	.17¼	.17½	.17¼	.17½
KANSAS—						
58-60 437 end point (New Navy)	.14¾	.15	.14½	.14¾	.14	.14½
NORTH TEXAS—						
48-52 450 end point (Naphtha)	.13¼	.13¾	.12¾	.13¼	.12¾	.13¼
50-52 440 end point (Naphtha)	.13½	.14	.13	.13½	.13	.13½
56-58 450 end point	.13¾	.14¼	.13¼	.13¾	.13¼	.13¾
58-60 437 end point (New Navy)	.14½	.15	.14	.14½	.14	.14½
60-62 400 end point	.15½	.16	.15	.15½	.15	.15½
64-66 390 end point	.16	.16½	.15½	.16	.15½	.16
NORTH LOUISIANA-ARKANSAS—						
50-52 450 end point			.14		.14	
58-60 450 end point	.13½	.14	.13¼	.13½	.13½	
58-60 437 end point (New Navy)	.14½	.15	.14		.14	.14½
60-62 400 end point	.15½	.16	.15½		.17¾	
64-66 375 end point	.17	.17½	.16½		.18½	
64-66 390 end point	.16½	.17	.16		.18	
ROCKY MOUNTAIN STATES—						
58-60 437 end point (New Navy)	.16½		.16½		.16½	
PENNSYLVANIA—						
52 Naphtha	.16		.15½		.14¾	
54 Naphtha	.16¼		.16		.15	
56 Gasoline	.16½		.16½		.15½	
58 Gasoline	.17¼		.16¾		.16	
60 Gasoline	.18¼		.17		.17	
62 Gasoline	.19		.18¼		.18¼	
64 Gasoline	.20½		.19¼		.19¼	
66 Gasoline	.22½		.22½		.22½	
68-70 Gasoline	.23½		.23¾		.23	

NATURAL GASOLINE

CHICAGO DIST. (Based on Group 3)—	Feb. 27		Feb. 20		Feb. 13	
80-84 compression, 330 end point	.12½	.13	.12	.12½	.11¾	.12¼
72-76 absorption, 375 end point	.13½	.14	.13	.13½	.12¾	.13¼
OKLAHOMA (Group 3)—						
Grade A, 72-78, under 375 e.p., rec. 90%	.14½	.15	.14	.14½	.13¾	.14¼
Grade B, 76-82, 375 end point, rec. 85%	.13¾	.14¼	.13½	.14	.13¼	.13¾
Grade C, 80-88, 350 end point, rec. 78%	.13¾	.14¼	.13¼	.13¾	.13	.13½
Grade D, 88-92, 350 end point	.13¼	.13¾	.13	.13½	.12¾	.13¼
NORTH TEXAS—						
80-84 compression	.13½	.14	.13	.13½	.13	.13½
84-90 compression	.13¼	.13¾	.12¾	.13¼	.12¾	.13¼
72-76 absorption	.14	.14½	.13½	.14	.13½	.14
76-82 absorption	.13½	.14	.13	.13½	.13	.13½
NORTH LOUISIANA-ARKANSAS—						
80-88 compression	.13	.14	.13½	.14	.12½	.13

BURNING OILS

CHICAGO DIST. (Based on Group 3)—	Feb. 27		Feb. 20		Feb. 13	
41-43 water white Kerosene	.04⅝	.04¾	.04½	.04¾	.04¾	.05
42-43 water white Kerosene	.04¾	.05	.04¾	.05	.05	.05¼
OKLAHOMA (Group 3)—						
41-43 water white Kerosene	.04¼	.04½	.04¼	.04½	.04¼	.04½
42-43 water white Kerosene	.04⅝	.04⅞	.04⅜	.04⅞	.04⅜	.04⅞
44-46 Kerosene Distillate	.06	.06¼	.06	.06¼	.06	.06¼
45-47 Kerosene Distillate (500 end point)	.07½	.08	.07½	.08	.07½	.08
46-48 Kerosene Distillate (480 end point)	.07⅞	.08	.07⅞	.08	.07⅞	.08
KANSAS—						
41-43 water white Kerosene	.04½	.04¾	.04¾	.05	.04¾	.05
NORTH TEXAS—						
41-43 water white Kerosene	.04	.04½	.04¼	.04½	.04	.04½
41-43 prime white Kerosene	.03¾	.04¼	.04	.04¼	.03¾	.04¼
40-42 prime white Distillate	.03½	.04	.03¾	.04	.03½	.04
NORTH LOUISIANA-ARKANSAS—						
41-43 water white Kerosene	.04½	.05	.04½	.05	.04½	
ROCKY MOUNTAIN STATES—						
40-42 prime white Kerosene	.07¾		.07¾		.07¾	
PENNSYLVANIA—						
43 Kerosene prime white	.07¼		.07¼		.07¼	
45 Kerosene water white	.07¾		.07¾		.07¾	
46 Kerosene water white	.09		.08¾		.09	
47 Kerosene	.10		.09¾		.10	
36 Miners' Neutral	.09		.08¼		.07¾	

LONDON

	Feb. 27	Feb. 20	Feb. 13
Bunker Fuel Oil, delivered, ton (shillings)	.60	.60	.60

FUEL OILS

CHICAGO DIST. (Based on Group 3)—	Feb. 27		Feb. 20		Feb. 13	
24-26 Fuel Oil (sellers' cars, Group 3)	1.05	1.10	1.05	1.10	1.10	1.15
22-24 Fuel Oil (Arkansas)	.90	.95	.90	.95	.85	.90
32-36 Gas Oil	.03⅜	.03⅝	.03⅜	.03⅝	.03⅛	.03⅜
KANSAS (Group 3)—						
24-26 Fuel Oil	1.10	1.15	1.10	1.15	1.05	1.10
32-36 Gas Oil	.03¼	.03½	.03¼	.03½	.03⅛	.03⅜
36-38 Distillate	.03½	.03¾	.03½	.03¾	.03½	.03¾
OKLAHOMA (Group 3)—						
24-26 Fuel Oil (buyers' cars)	1.00	1.05	1.00	1.05	.95	1.00
24-26 Fuel Oil (sellers' cars)	1.05	1.10	1.05	1.10	1.00	1.05
28-30 Fuel Oil (sellers' cars)	1.15	1.20	1.15	1.20	1.10	1.15
32-36 Gas Oil	.03¼	.03¾	.03¼	.03⅜	.03¼	.03⅜
38-40 Straw Distillate	.03½	.03¾	.03½	.03¾	.03½	.03¾
NORTH TEXAS—						
24-26 Fuel Oil	1.15	1.25	1.15	1.25	1.00	1.10
26-30 Fuel Oil	1.20	1.30	1.20	1.30	1.05	1.15
32-36 Gas Oil	.30	.03¼	.03¼	.03½	.02¾	.03¼
36-38 Gas Oil	.03	.03½	.03⅜	.03⅝	.02¾	.03¼
38-40 Straw Distillate	.03¼	.03½	.03½	.03¾	.03	.03½
NORTH LOUISIANA-ARKANSAS—						
24-26 Fuel Oil	1.10		1.10	1.20	1.20	1.25
32-36 Gas Oil	.03¼		.03¼		.03¼	
38-40 light straw distillate	.03½	.03¾	.03½	.03¾	.03½	.03¾
GULF COAST (South Texas)—						
Gas Oil	.05	.05½	.05	.05½	.04½	.05
Gulf Coast Fuel	1.60	1.75	1.60	1.75	1.45	1.60
PENNSYLVANIA—						
30-34 Fuel Oil	.06½		.06¼		.06¼	
36-40 Fuel Oil	.06¾		.06½		.06½	
34 Neutral	.10		.09		.08¼	

ROAD OILS

OKLAHOMA (Group 3)—	Feb. 27		Feb. 20	Feb. 13
50-60 Asphaltic content	1.30	1.40		
60-70 Asphaltic content	1.50			

NEUTRAL OILS

OKLAHOMA (Group 3)—	Feb. 27		Feb. 20		Feb. 13	
Pale Neutrals:						
70-80 vis., 2½ color, 20-25 cold test	.50¼	.05½	.05¼	.05½	.05¼	.05½
100 vis., 2 color, 20-25 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
100 vis., 3 color, 20-25 cold test	.06¾	.07	.06¾	.07	.06¾	.07
150 vis., 3 color, 20-25 cold test	.10½	.11	.10½	.11	.10½	.11
150 vis., 4 color, 20-25 cold test	.10¼	.10½	.10¼	.10½	.10¼	.10½
180 vis., 4 color, 23-28 cold test	.11¾	.12¼	.11¾	.12¼	.11¾	.12¼
180 vis., 3 color, 23-28 cold test	.12½	.13	.12½	.13	.12½	.13
200 vis., 3 color, 23-28 cold test	.13	.13½	.13	.13½	.13	.13½
200 vis., 4 color, 23-28 cold test	.12¼	.12¾	.12¼	.12¾	.12¼	.12¾
220 vis., 3 color, 25-30 cold test	.14	.14½	.14	.14½	.14	.14½
220 vis., 4 color, 25-30 cold test	.13¼	.13¾	.13¼	.13¾	.13¼	.13¾
240 vis., 4 color, 25-30 cold test	.14¼	.14¾	.14¼	.14¾	.14¼	.14¾
280 vis., 3 color, 25-30 cold test	.17½	.18	.17½	.18	.17½	.18
280 vis., 4 color, 25-30 cold test	.16½	.17	.16½	.17	.16½	.17
300 vis., 3 color, 25-30 cold test	.18	.18½	.18	.18½	.18	.18½
Red Neutrals:						
180 vis., 5 color, 23-28 cold test	.11	.11½	.11	.11½	.11	.11½
180 vis., 6 color, 23-28 cold test	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾
200 vs., 5 color, 23-28 cold test	.11½	.12	.11½	.12	.11½	.12
200 vis., 6 color, 23-28 cold test	.10¾	.11¼	.10¾	.11¼	.10¾	.11¼
220 vis., 5 color, 25-30 cold test	.12½	.13	.12½	.13	.12½	.13
220 vis., 6 color, 25-30 cold test	.11¾	.12¼	.11¾	.12¼	.11¾	.12¼
240 vis., 5 color, 25-30 cold test	.13½	.14	.13½	.14	.13½	.14
240 vis., 6 color, 25-30 cold test	.13	.13¼	.13	.13¼	.13	.13¼
280 vis., 5 color, 25-30 cold test	.14½	.15	.14½	.15	.14½	.15
280 vis., 6 color, 25-30 cold test	.13½	.14	.13½	.14	.13½	.14
300 vis., 5 color, 25-30 cold test	.14½	.15	.14½	.15	.14½	.15
150-160 vis., 1 color, 40-50 cold test	.06½	.07¼	.06½	.07¼	.06½	.07¼
190-200 dark green, 40-50 cold test	.05½	.06	.05½	.06	.05½	.06
600 steam refined	.16	.16½	.16	.16½	.16	.16½
590-600 Bright Stock	.27	.29	.27	.29	.27	.29
Waxes:						
124-126 White Crude Scale Wax	.02½		.02⅜		.02⅜	
PENNSYLVANIA—						
150, 3 color	.27		.25½		.25	
180, 3 color	.29½		.29½		.29	
200, 3 color	.32½		.32		.31	
220, 3 color	.34½		.34		.33	
600, steam refined	.15¾		.15½		.13½	
635, steam refined	.17¾		.17¾		.15½	
650, steam refined	.19½		.19		.18	
600, Pennsylvania flash	.22		.21¾		.20	
630, Pennsylvania flash	.25		.25½		.25	
*550, E filtered	.18½		.18½		.16	
*600, E filtered	.22		.22		.17	
600, E filtered	.19½		.19½		.18	
600, D filtered	.25½		.25½		.25	
550, E filtered	.19		.19		.16	
550, D filtered	.18		.18		.18	
Pennsylvania Bright Stock	.40		.40		.35	
†122-124 White Crude Scale Wax	.02¾		.02¾		.02¾	
†124-126 White Crude Scale Wax	.02⅞		.02⅞		.02⅞	

*At Warren, Penn. †At New York City.

REFINERY AND CRUDE PRICES

Quotations on Principal Refined Products and Crude Petroleum Markets in All the American Oil Fields

GULF COAST (SOUTH TEXAS)—	Feb. 27		Feb. 20		Feb. 13	
Lubricating Stocks:						
Zero Black	.05¼	.06	.05½	.06	.05½	.06
No. 2 color, 100 vis., pale oil	.07¼	.07¾	.07¼	.07¾	.07	.07½
No. 2½ color, 150 vis., pale oil	.10¼	.11	.10¼	.11	.10	.10½
No. 3 color, 200 vis., pale oil	.12¼	.13	.12¼	.13	.12¼	.13
No. 3½ color, 300 vis., pale oil	.15¾	.16½	.15¾	.16½	.15½	.16¼
No. 3¾ color, 500 vis., pale oil	.18¼	.19½	.18¼	.19¼	.18¼	.19½
No. 4 color, 750 vis., pale oil	.26¾	.27¾	.26¾	.27¾	.26½	.27½
No. 1½ color, 100 vis., pale, filtered	.11¼	.12	.11¼	.12	.11	.11½
No. 1½ color, 150 vis., pale, filtered	.12¼	.13½	.12¼	.13½	.12½	.13½
No. 2 color, 200 vis., pale, filtered	.17¼	.18¼	.17¼	.18¼	.17	.18
No. 2 color, 300 vis., pale, filtered	.19¼	.20½	.19¼	.20½	.19	.20
No. 2½ color, 500 vis., pale filtered	.22¾	.24	.22¾	.24	.22¼	.23½
No. 2½ color, 750 vis., pale, filtered	.32¾	.33½	.32¾	.33½	.32½	.33½
No. 5 color, 200 vis., red oil	.10¼	.11½	.10¼	.11½	.10¼	.11½
No. 5 color, 300 vis., red oil	.12¼	.13½	.12¼	.13½	.12¼	.13½
No. 6 color, 500 vis., red oil	.15¾	.17	.15¾	.17	.15¼	.16½
No. 5 color, 750 vis., red oil	.24½	.25½	.24½	.25½	.24½	.25½

MOTOR NATURAL GASOLINE (BLENDS)

CHICAGO DIST. (Based on Group 3)—	Feb. 27		Feb. 20		Feb. 13	
60-62 450 end point	.13¼	.13¾	.13	.13¼	.13	.13¼
64-66 450 end point	.13¾	.14¼	.13¼	.13½	.13¼	.13½
OKLAHOMA (Group 3)—						
60-62 450 end point	.13½	.14	.13	.13¼	.12¾	.13
64-68 450 end point	.13¾	.14¼	.13¼	.13¾	.13	.13½
68-70 430-435 end point	.14	.14½	.13½	.14	.13¼	.13¾
NORTH TEXAS—						
58-62 440 end point	.13½	.14	.13	.13½	.13	.13½
58-62 450 end point	.13¼	.13¾	.12¾	.13¼	.12¾	.13¼
PENNSYLVANIA						
*60-62	.15¾		.15¾		.15	
*64-66	.16½		.15¾		.15¼	
*66-68	.16½		.15¾		.15¼	
*68-70	.16½		.15¾		.15½	

*At Sistersville, W. Va.

NEW YORK DOMESTIC MARKET

Motor Gasoline:	Feb. 27	Feb. 20	Feb. 13
Greater New York, in steel barrels	.23	.23	.23
New York State (outside Greater New York and New England, tank wagon	.23	.23	.23
Bulk, delivered at New York	.18	.18	.18
New Jersey, tank wagon	.23½	.22½	.22½
V.M.P. Naphtha, in steel barrels	.22	.22	.22
Kerosene:			
Greater New York, tank wagon	.15	.15	.15
New York State (outside Greater New York and New England, tank wagon	.15	.15	.15
Bulk, delivered at New York	.09	.10	.10
New Jersey, tank wagon	.13½	.13½	.13½
Lubricating Oil (industrial) at refinery, Bayonne, N. J.:			
Cylinder, light filtered, in barrels	.38	.38	.38
Cylinder, dark filtered, in barrels	.33	.33	.33
Cylinder Bright Stock	.46	.46	.46
Cylinder, steam refined (600)	.22½	.22½	.22½
Black, in bulk	.11	.11	.10
Bloomless, white, 30-31 gravity, 170 vis	.44	.44	.43
Bloomless, 885 specific gravity	.19	.19	.18
Red Paraffin:			
170 viscosity	.19	.19	.19
212 viscosity	.21	.21	.21
265 viscosity	.23	.23	.23
295 viscosity	.26	.26	.26
Paraffin, 903 specific gravity	.24	.24	.24
Spindle, 200 vis. at 100	.26	.26	.26
Lubricating Oil (motor), discount to dealers:			
Cylinder, in barrels	1.00	1.00	1.00
Steam tractors, in barrels	1.00	1.00	1.00
Transmission and differential, in barrels	.09½	.09½	.09½
Motor Grease, in barrels, pound	.13	.13	.13
*Fuel Oil:			
Bunker Oil, 14 plus, delivered in barges, bbl	1.60	1.60	1.60
Diesel Oil, at refinery, gallon	.04¾	.04¾	.04½
Gas Oil, delivered in New York	.05	.05	.05
Wax, fully refined:			
120-122 a.m.p.	.03⅛	.03⅛	.03⅛
125-127 a.m.p.	.03	.03½	.03
130-132 a.m.p.	.04	.04	.04
135-137 a.m.p.	.05	.05	.05

*Lighterage, 6.5c a barrel extra.

NEW YORK EXPORT PRICES

	Feb. 27	Feb. 20	Feb. 13
Motor Gasoline, in cases, gallon	.29¾	.28¾	.28¾
Motor Gasoline, U. S. Navy, spec., gallon	.16½	.15½	.15½
Naphtha, 60° F., 59-61 spec. grav.	.19	.18	.18
Naphtha, 60° F., 63-66 spec. grav.	.22	.21	.21
Naphtha, 60° F., 66-68 spec. grav.	.23	.22	.22
Kerosene:			
Standard white, in bulk, gallon	.07	.07	.07
Standard white, in barrels, gallon	.13¼	.13¼	.13¼
Standard white, in cases, gallon	.16½	.16½	.16½
Water white, in bulk, gallon	.08	.08	.08
Water white in barrels, gallon	.14¼	.14¼	.14¼
Water white, in cases, gallon	.17½	.17½	.17½

CRUDE OIL PRICES

Feb. 12.—Standard Oil Co. of Louisiana advanced all grades of Northern Louisiana and Arkansas crudes 10 cents. Magnolia Petroleum Co. advanced Healdton (Okla.) crude of below 28° gravity 15 cents, 28° to 30.9° gravity 30 cents and advanced all other grades 10 cents; same company advanced Mexia crude 10 cents.

Feb. 13.—Ohio Oil Co. advanced Lima, Indiana, Wooster, Illinois, Princeton, Plymouth and Waterloo crudes 10 cents. Magnolia Petroleum Co. advanced Corsicana light, Corsicana heavy and Thrall (Tex.) crudes 15 cents. Canadian crudes advanced 10 cents.

Feb. 13.—The Texas Co. posts first quotation for Smackover (Ark.) crude. Quotations same as Standard Oil Co. of Louisiana.

Feb. 15.—Seep Purchasing Agency advanced Pennsylvania, Bradford-Allegany crudes 25 cents, Cabell, Somerset and Corning crudes 15 cents and Ragland 10 cents.

Feb. 17.—Prairie Oil and Gas Co. advanced all grades of Oklahoma, Kansas and North Texas crudes 10 cents. Quotations met by major purchasing companies. Magnolia Petroleum Co. advanced Healdton (Okla.) grade of below 28° gravity and 28° to 30.9° gravity 5 cents and all other grades 10 cents; same company advanced Thrall (Tex.), Corsicana heavy and light crudes 5 cents and Mexia 10 cents. The Texas Co. posts flat price of $1.10 for Healdton (Tex.) crude and advances Currie crudes 10 cents; same company met Magnolia price for Mexia crude. Ohio Oil Co. and Midwest Refining Co. advanced Wyoming and Montana crudes 10 cents. Standard Oil Co. of Louisiana advanced all North Louisiana and Arkansas fields 10 cents.

Feb. 19.—Ohio Oil Co. advanced Lima, Indiana, Illinois, Princeton, Waterloo, Wooster and Plymouth crudes 10 cents.

Oklahoma and Kansas

Below 28°	$1.50
28° to 29.9°	1.60
30° to 32.9°	1.70
33° to 34.9°	1.85
35° to 36.9°	2.00
37° to 38.9°	2.20
39° to 40.9°	2.40
41° and above	2.60

Magnolia Petroleum Co.

(Healdton Grade)

Below 28°	$ .90
28° to 30.9°	1.25
31° to 32.9°	1.70

The Texas Co. pays $1.10 flat for all Healdton crude it runs.

Arkansas and Northern Louisiana

Homer, Caddo, Haynesville, and El Dorado Fields:

Below 30°	$1.35
30° to 32.9°	1.70
33° to 34.9°	1.85
35° to 36.9°	2.00
37° to 38.9°	2.20
39° and above	2.40
Bull Bayou, 38° and above	2.00
35° to 37.9°	1.90
32° to 34.9°	1.85
Crichton crude	1.85
De Soto crude	2.20
Bellevue	1.35
Smackover, 26° and above	1.35
Below 26°	.90

Wyoming and Montana

Rock Creek (Wyo.)	$1.75
Salt Creek	1.65
Big Muddy	1.65
Mule Creek	1.50
Grass Creek	2.10
Elk Basin	2.10
Lance Creek	2.10
Osage	2.10
Cat Creek (Mont.)	2.15
Sunburst (Mont.) below 28°	1.30
28° to 33.9°	1.40
34° and above	1.50
Greybull and Torchlight	2.10
Ferris	1.85
Hamilton Dome	1.65

Lander and Lost Soldier based on contracts covering entire production of fields.

North and Central Texas

Moran, Burkburnett, Electra, Archer County, Stephens County, Strawn, Ranger, Desdemona, Pioneer and Young County.

Below 28°	$1.50
28° to 29.9°	1.60
30° to 32.9°	1.70
33° to 34.9°	1.85
35° to 36.9°	2.00
37° to 38.9°	2.20
39° to 40.9°	2.40
41° and above	2.60
Thrall	1.90
Corsicana light	1.50
Corsicana heavy	.90
Mexia	2.20
Currie, below 41°	2.20
41° and above	2.60

Gulf Coast

Sour Lake, Humble, Markham, Goose Creek, Vinton, West Columbia, Orange, Jennings, Spindletop, Pierce Junction "A", and Hull, Blue Ridge "A"	$1.50
Pierce Junction "B", Blue Ridge "B"	1.05

California

14° to 19.9°	$ .60
20° to 20.9°	.62
21° to 21.9°	.65
22° to 22.9°	.70
23° to 23.9°	.75
24° to 24.9°	.80
25° to 25.9°	.85
26° to 26.9°	.90
27° to 27.9°	.95
28° to 28.9°	1.00
29° to 29.9°	1.05
30° to 30.9°	1.11
31° to 31.9°	1.17
32° to 32.9°	1.24
33° to 33.9°	1.31
34° to 34.9°	1.38
35° gravity and above	1.45

Eastern States

Penna Grade Oil in New York Transit Lines	$4.25
Bradford District Oil in National Transit Lines	4.25
Penna Grade Oil in National Transit Lines	4.00
Penna Grade Oil in South West Pa. Pipe Lines	4.00
Penna Grade Oil in Eureka Pipe Line Lines	4.00
Penna Grade Oil in Buckeye Pipe Line Lines	4.00
Corning Grade Oil in Buckeye Pipe Line Lines	2.30
Cabell Grade Oil in Eureka Pipe Line Lines	2.76
*Somerset Medium Oil in Cumberland Pipe Line Lines	2.55
*Somerset Light Oil in Cumberland Pipe Line Lines	2.80
Ragland Grade Oil in Cumberland Pipe Line Lines	1.10
Lima	2.58
Wooster	2.50
Illinois	2.37
Indiana	2.38
Princeton	2.37
Plymouth	1.75
Waterloo	1.85
*Petrolia, Canada	2.98
*Oil Springs, Canada	3.05

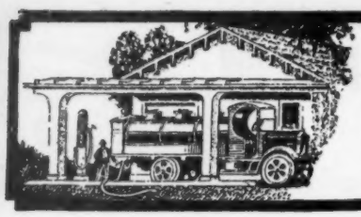
*Plus Government bounty of 52½c.

†Somerset oil commands 6 cents over the above posted price.

Mexican Crude

*Tuxpam (f.o.b. Mexican ports)	$1.35
†Panuco (f.o.b. Mexican ports)	1.00
Tuxpam (New York)	1.87
Panuco (New York)	1.48

*Plus 25.98c tax. †Plus 16.72c tax. Prices based on contracts.



TANK WAGON MARKETS

Tank wagon quotation for gasoline and kerosene in the United States, as furnished by the larger marketing concerns, Feb. 27

STANDARD OIL CO. (INDIANA)

Main Service Station Price

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Chicago district	20.0	22.0	11.5
Decatur, Ill.	20.8	22.8	12.0
Joliet	20.0	22.0	12.3
Peoria	20.8	22.8	12.0
Quincy	20.6	22.6	11.8
Davenport, Iowa	21.1	23.1	12.4
Des Moines	21.1	23.1	12.4
Keokuk	21.1	23.1	12.4
Sioux City	20.7	22.7	12.0
Duluth, Minn.	21.8	23.8	13.1
Minneapolis	21.5	23.5	13.1
La Crosse, Wis.	21.8	23.8	12.9
Milwaukee	20.6	22.6	11.7
Madison	20.9	22.9	12.0
Detroit, Mich.	21.4	23.4	12.7
Grand Rapids	21.3	23.3	12.6
Saginaw	21.5	23.5	12.8
Evansville, Ind.	20.6	22.6	12.0
Fort Wayne	21.0	23.0	12.4
Indianapolis	20.8	22.8	12.2
South Bend	21.0	23.0	12.4
Fargo, N. D.	24.3	26.3	15.0
Huron, S. D.	23.6	25.6	13.6
Soux Falls	23.1	25.1	13.1
Kansas City, Mo.	17.5	19.5	10.8
Springfield	20.4	22.4	11.7
St. Louis	20.5	22.5	11.5
St. Joseph	20.9	22.9	11.8
Wichita, Kans.	20.4	22.4	11.3

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Dallas, Tex.	18.0	21.0	12.0
Fort Worth	18.0	21.0	12.0
Houston	18.0	21.0	12.0
San Antonio	15.0	18.0	11.0
El Paso	17.0	22.0	13.0
Muskogee, Okla.	20.0	23.0	11.0
Oklahoma City	20.0	23.0	11.0
Tulsa	20.0	23.0	11.0
Fort Smith, Ark.	18.0	21.0	12.0
Little Rock	19.5	21.5	13.0
Texarkana	18.0	21.0	12.0

SOUTHERN TERRITORY

Standard Oil Co. (Kentucky)

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Atlanta, Ga.	23.0	25.0	14.0
Augusta	23.0	25.0	14.0
Macon	23.0	25.0	15.0
Savannah	21.0	23.0	13.0
Birmingham, Ala.	21.0	23.0	14.5
Mobile	20.0	22.0	13.5
Montgomery	21.0	23.0	15.0
Clarksdale, Miss.	21.5	23.5	12.5
Jackson	21.5	23.5	12.5
Natchez	21.0	23.0	12.5
Vicksburg	21.0	23.0	12.5
Jacksonville, Fla.	21.0	23.0	13.0
Miami	24.0	26.0	15.5
Pensacola	21.0	23.0	13.5
Tampa	21.0	23.0	13.0
Covington, Ky.	22.0	24.0	13.0
Lexington	23.0	25.0	14.0
Louisville	22.0	24.0	13.0

Prices in Kentucky, Mississippi and Georgia include 5c road tax.

CHICAGO TANK WAGON

(Chicago Territory)

Gasoline	20.0
Kerosene	11.5

Tank wagon prices on Jan. 25, 1921, down 2c on g., 3c on k.; Feb. 1, both down 2c; April 28, both down 3c; July 25, g. down 2c; Oct. 15, g. up 1c; Oct. 23, k. up 1c; Nov. 9, g. up 1¼c; k. 1c; April 10, 1922, g. up 1½c; May 8, g. up 1c; June 27, both up 1c; July 19, g. down 2c; k. down 1c; Oct. 10, g. down 2c; Oct. 31, g. down 1c; Feb. 5, 1923, g. up 1c; Feb. 20, g. up 1c.

ATLANTIC TERRITORY

Atlantic Refining Co.

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Pittsburgh, Pa.	23.0	26.0	14.0
Philadelphia	23.0	26.0	14.0
Dover, Del.	23.0	26.0	14.0
Wilmington	23.0	26.0	14.0
Providence, R. I.	24.5	26.5	15.0
Springfield, Mass.	24.5	26.5	15.0
Worcester	24.5	26.5	15.0
Hartford, Conn.	24.5	26.5	15.0
New Haven	24.5	26.5	15.0
Boston	24.5	26.5	15.0

ATLANTIC COAST ZONE

Standard Oil Co. (New Jersey)

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Atlantic City, N. J.	23.5	25.5	13.5
Newark	23.5	25.5	13.5
Annapolis, Md.	24.5	26.5	13.5
Baltimore	23.5	25.5	12.5
Cumberland	25.0	27.0	14.5
Washington, D. C.	23.0	25.0	13.0
Norfolk, Va.	21.5	23.5	12.5
Petersburg	24.0	26.0	14.0
Danvills	22.5	24.5	14.5
Richmond	23.0	25.0	13.0
Roanoke	24.0	26.0	14.5
Charleston, W. Va.	22.5	24.5	13.0
Keyser	24.0	26.0	14.5
Parkersburg	22.0	24.0	11.5
Wheeling	22.0	24.0	13.0
Charlotte, N. C.	23.5	25.5	14.0
Hickory	24.0	26.0	14.5
Mt. Airy	24.0	26.0	14.5
Salisbury	24.0	26.0	14.5
Charleston, S. C.	22.5	24.5	11.5
Columbia	24.5	26.5	13.5

NEW ENGLAND REGION

Standard Oil Co. (New York)

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Albany, N. Y.	24.5	27.5	15.0
*New York	24.5	27.5	15.0
Buffalo	24.5	27.5	15.0
Providence, R. I.	24.5	27.5	15.0
Augusta, Me.	24.5	27.5	15.0
Manchester, N. H.	24.5	27.5	15.0
Burlington, Vt.	24.5	27.5	15.5

*Price in steel bbls.

ROCKY MOUNTAIN REGION

Continental Oil Co.

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Denver, Colo.	21.0	23.0	13.5
Glenwood Springs	26.0	....	11.5
Pueblo	21.0	23.0	13.5
Basin, Wyo.	20.0	....	14.0
Casper	17.5	19.5	12.0
Cody	22.0	....	16.0
Cheyenne	20.0	22.0	13.5
Billings, Mont.	23.0	25.0	15.0
Butte	24.5	26.5	16.0
Great Falls	24.5	26.5	17.0
Helena	24.5	26.5	17.0
Miles City	24.0	26.0	16.5
Ogden, Utah	23.0	25.0	16.5
Salt Lake City	23.0	25.0	16.5
Boise, Idaho	24.0	26.0	19.0
Albuquerque, N. M.	25.5	27.5	17.5

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
New Orleans, La.	18.5	20.5	12.0
Alexandria	19.5	21.5	13.0
Baton Rouge	18.0	20.0	11.5
Lake Charles	19.5	21.5	13.0
Shreveport	18.5	20.5	12.0
Memphis, Tenn.	18.0	20.0	14.0
Chattanooga	18.5	20.5	14.5
Knoxville	19.5	21.5	15.0
Nashville	18.5	20.5	14.5
Little Rock, Ark.	19.5	21.5	13.0
Camden	19.5	21.5	13.0

BUCKEYE DISTRICT

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
All Ohio points	21.0	23.0	13.0

NEBRASKA POINTS

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
Omaha	19½	21½	12¼
Crawford, Neb.	19¼	....	13¾
McCook	22	24	14¼
Norfolk	21	23	12½
North Platte	22	24	14¼
Scott's Bluff	20½	22½	13½

PACIFIC COAST TERRITORY

Standard Oil Co. (California)

	Gasoline		Oil
	Tank wagon	Service station	Tank wagon
San Francisco, Cal.	17.0	20.0	15.5
Los Angeles	17.0	20.0	15.5
Fresno	17.5	20.5	17.5
Reno, Nev.	20.5	23.5	19.0
Portland, Ore.	20.0	23.0	16.5
Seattle, Wash.	19.0	22.0	16.5
Spokane	22.5	25.5	20.5
Tacoma	19.0	22.0	16.5
Phoenix, Ariz.	23.5	26.5	21.5
Honolulu, Hawaii	18.5	21.5	17.5
Juneau, Alaska	19.5	22.5	18.0

STATE LAWS AND REGULATIONS

Gasoline Sales Tax for Roads

Arkansas, Colorado, Connecticut, Florida, Georgia, Kentucky, Louisiana, Montana, Maryland, New Mexico, North Carolina, Pennsylvania, South Dakota, Mississippi and Washington, 1 cent a gallon.

Oregon and South Carolina collect 2 cents a gallon.

State Inspection Tax

Alabama—One-twentieth of 1 cent a gallon on motor fuel; ½ cent a gallon refined oil inspection.

Arkansas and South Carolina—One-eighth of a cent a gallon on gasoline and kerosene.

Florida—One-thirteenth of a cent a gallon on both gasoline and refined oils.

Kansas—One cent a barrel on gasoline and kerosene.

Georgia—One-half cent a gallon both refined oil and gasoline inspection.

Louisiana—One-eighth of a cent inspection tax per gallon on both gasoline and kerosene.

Kentucky—One-fifth of a cent a gallon on refined oil and gasoline inspection.

Minnesota, South Dakota and Wisconsin—Five cents a barrel on refined oils.

Nebraska—Twenty-five cents a barrel from 1 to 5 barrels, and 6 cents a barrel on 6 barrels or more.

SUES FOR INJUNCTION ON GOVERNMENT LAND GRANT

WASHINGTON, D. C., Feb. 24.—Francis J. Carman, of New York, in the capacity of a taxpayer, filed suit for injunction in the Supreme Court of the District of Columbia yesterday against the Pan-American Oil & Transport Co., a corporation of Delaware, and Albert B. Fall, Secretary of the Interior, and Edwin Denby, Secretary of the Navy.

Mr. Carman seeks to prevent the carrying out of an alleged illegal contract made by the two cabinet officers with the oil company, by which the latter is given a perpetual lease of 39,000 acres of petroleum-laden land in Kern County, California. The lease was entered into last December, and the plaintiff claims, was made without legal authority and is detrimental to all the taxpayers of the United States. He is represented by Attorney Edmund Burke. C. E. K.

TANK WAGON CHANGES

Effective February 8, Standard Oil Co. of California advanced gasoline 1 cent in Arizona.

Effective February 20, Magnolia Petroleum Co. advanced gasoline one-half cent at Little Rock, Ark.

Effective February 22, Standard Oil Co. of Nebraska advanced gasoline 1 cent and reduced kerosene one-half cent in Nebraska.

Effective February 23, Atlantic Refining Co. advanced gasoline 1 cent in Pennsylvania and Delaware. Continental Oil Co. advanced gasoline 1 cent in Colorado, Wyoming, Montana, and one-half cent in Utah. Standard Oil Co. of New Jersey advanced gasoline 1 cent in Maryland, Virginia, West Virginia, District of Columbia and 1½ cents in North Carolina and South Carolina. Magnolia Petroleum Co. reduced gasoline 2 cents at San Antonio, Tex.

Effective February 24, Standard Oil Co. of Ohio advanced gasoline 1 cent in Ohio. Magnolia Petroleum Co. advanced gasoline 2 cents in Oklahoma, with exception of Oklahoma City, where advance was 3 cents.

Effective February 26, Standard Oil Co. of New York advanced gasoline 1½ cents in entire territory. Standard Oil Co. of Kentucky advanced gasoline 2 cents throughout entire territory. Atlantic Refining Co. advanced gasoline 1½ cents in entire territory, with exception of Pennsylvania and Delaware.

DR. HUBERT WORK TO SUCCEED SEC'Y. FALL

WASHINGTON, Feb. 26.—Selection of Dr. Hubert Work, now postmaster-general, to succeed Albert B. Fall as secretary of the interior and of Senator Harry S. New of Indiana to become postmaster-general was announced today at the White House.

The change in the cabinet lineup is to take place on March 4 when Mr. Fall retires after two years' service and the nominations of Mr. Work and Senator New were sent to the Senate today to permit their confirmation before the present session of Congress comes to an end.

The selection of Dr. Work to take the interior portfolio has been forecast ever since President Harding began to turn over in his mind the names of available candidates. A resident of Colorado and a man of demonstrated ability in governmental organization, Dr. Work is regarded by the President as fulfilling all the qualifications for an interior secretary.

MILLER PETROLEUM CO. TO INSTALL CROSS PROCESS

The Gasoline Products Co., with offices in New York and Kansas City, Mo., during the past week closed a contract with the Miller Petroleum Co. for the installation of two units of the Cross cracking process at the Wichita Falls, Tex., and Humboldt, Kans., plants of the company. The Gasoline Products Co. has partially completed two units of the process at the Dallas, Tex., refinery of the Clayton Oil & Refining Co. The two units at the Okmulgee, Okla., plant of the Waite Phillips Co. are about two-thirds completed.

According to officials of the Gasoline Products Co., approximately 1,000,000 bbls. of oil were treated with the Cross cracking process during 1922. Eleven plants were built during the year and 24 additional installations will be made this year based on contracts made up to the present time. Refineries in the Mid-Continent area which are using the Cross process or have made contracts providing for its installation are Globe Oil & Refining Co., Blackwell, Okla.; Johnson Oil Refining Co., Cleveland, Okla.; Indiahoma Refining Co., Okmulgee, Okla.; North American Refining Co., Rosedale, Okla., and Sapulpa Refining Co., Sapulpa, Okla.

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Put Metalsteel Aluminum Paint on all types of tank storage! It will cut your evaporation losses to the lowest possible figure—its heat-deflecting properties are practically 10 per cent greater than white paint, 28 per cent greater than light gray and 165 per cent greater than black. These are figures based on actual scientific tests.

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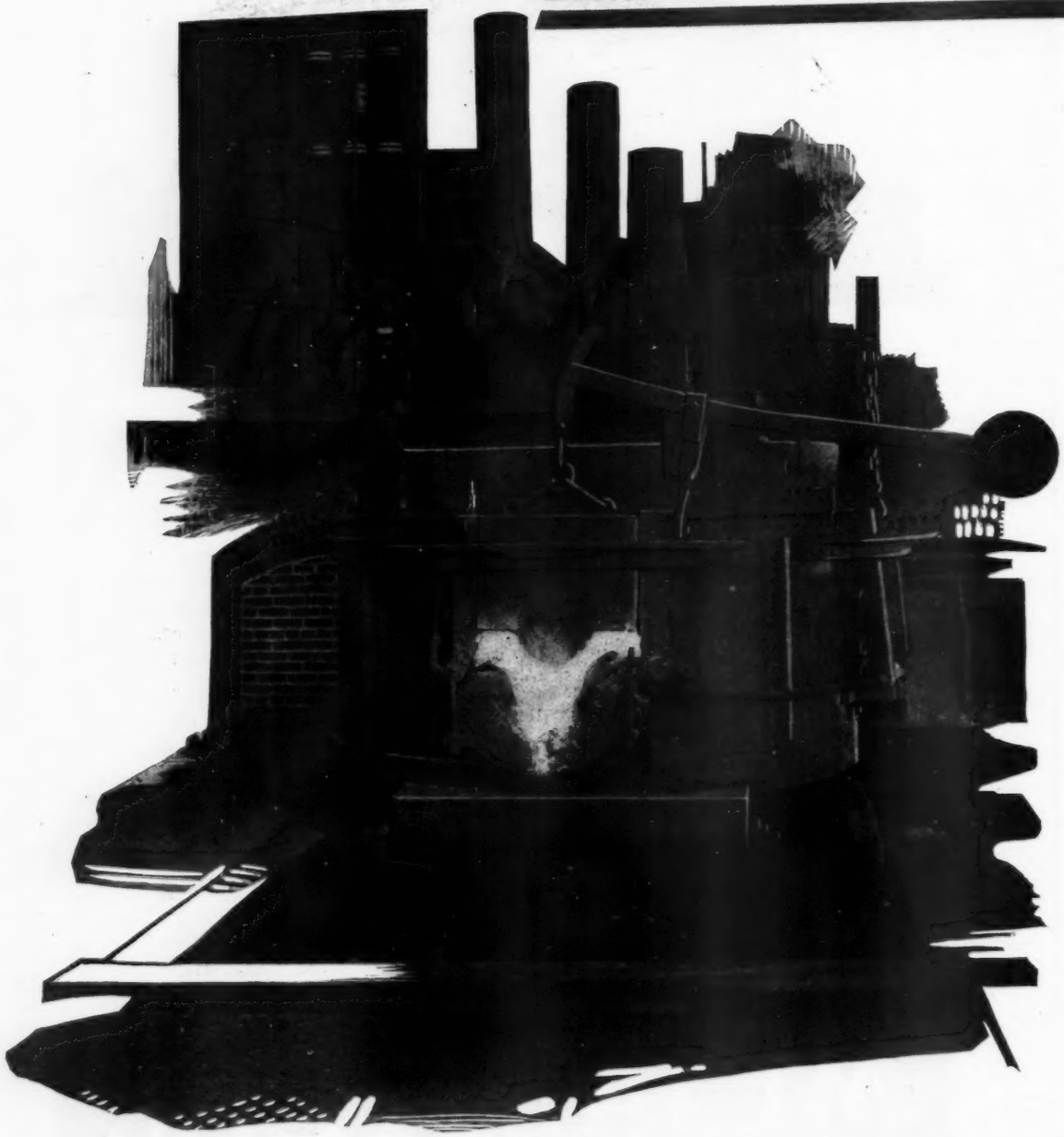

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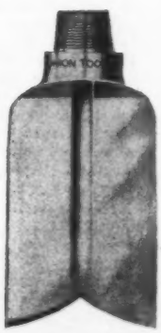
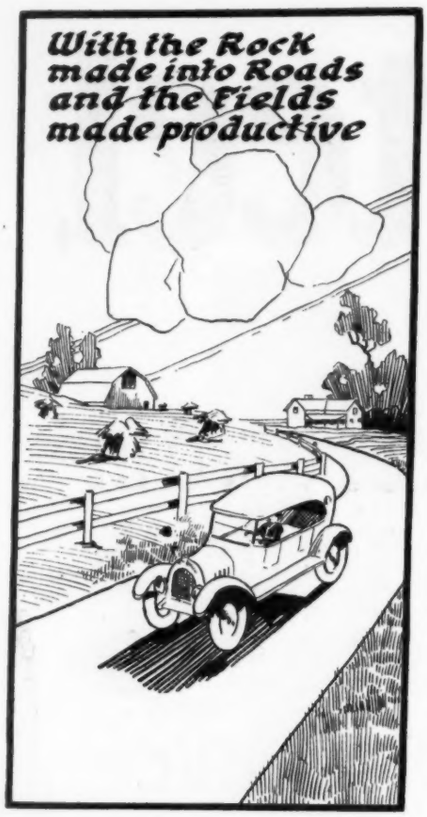


SUPPLY COMPANIES

NSCO



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NATIONALLY KNOWN SPEAKERS TO ADDRESS CHICAGO MEETING

CHICAGO, Ill., Feb. 26.—Several speakers of national prominence in the oil industry and the political world are scheduled to make addresses at the first convention of the American Oil Men's Association to be held here March 6. 7 and 8 at the Congress Hotel. Officers and members of the executive committee of the association are to meet here Wednesday afternoon at the call of E. E. Smith, president of the association, to make final arrangements for the convention.

Herbert Hoover, secretary of commerce, is expected to be present one day of the convention and deliver one of the principal addresses. An effort is being made to have him present at the annual banquet which will be held on the night of March 8. Charles H. Brough, former governor of Arkansas and Congressman J. W. Rainey of Illinois have accepted invitations to be present at the annual banquet. Former Governor Brough was a speaker at the convention of the Independent Oil Men's Association held two years ago here and made a very favorable impression among oil men at that time.

H. G. James, former secretary of the Western Petroleum Refiners Association, Kansas City, Mo., will be one of the speakers at the opening day. D. W. Moffitt, vice president of Cosden & Co., Tulsa, will also be one of the speakers of the first or second day. He will talk briefly on the subject, "The Petroleum Industry." Mr. Moffitt is recognized as one of the thoroughly experienced men of the industry.

To Show Testing Methods

On the first day of the convention, Dr. Charles K Francis, vice president and technologist of the Producers and Refiners Corporation of this city, will conduct a demonstration of the most modern and approved methods in the testing of various petroleum products. This should be excellent instruction for members of the jobbing and marketing division of the industry. Dr. Francis will supplement his lecture with a brief talk outlining his reasons for giving various tests to particular products. Before his connection with the Producers and Refiners Corporation, Dr. Francis was associated with Cosden & Co. as chief chemist and technologist.

In addition to these speakers, invitations have been extended to Senator Robert L. Owen of Oklahoma and R. L. Welch, secretary of the American Petroleum Institute. It is not known at this writing whether it will be possible for them to be present.

Besides the set speeches, business sessions will be held at which subjects of special interest to refining, marketing and jobbing will be discussed. Although no definite program for these meetings has been announced, it is known that officials of the association plan to make them one of the features of the convention.

The exhibits of the manufacturers and jobbers of supplies and equipment promises to be one of the largest and most attractive that has ever been held under the auspices of a similar association. Thirty-eight reservations have been made up to this time. The exhibits will be held in the Gold Room of the Congress Hotel.

All railroads have granted a fare and one-half rate to Chicago for the convention. Those attending are advised to secure certificates on purchase of ticket, which will entitle them to half fare in the purchase of their return ticket. The Kansas City Oil Men's Club of Kansas City has announced that it will run a special train to Chicago from Kansas City on Monday night. The club will entertain those who take this train, at a dinner Monday in Kansas City.

TANK WAGON ADVANCES AID TO PENNSYLVANIA MARKET

OIL CITY, Pa., Feb. 26.—Advances last Friday in gasoline tank wagon prices by the Atlantic Refining Co. and the Standard Oil Co. of New Jersey helped considerably to make the outlook for the refining industry in northwestern Pennsylvania look brighter. Weather during the past few weeks has been very bad for gasoline. Below zero temperatures and heavy snowstorms have been frequent and have done much to reduce the sales of gasoline in this territory. As a result, gasoline is moving slowly, although prices are holding. firm

There are no more neutrals to be obtained in this refining district, all of this product which is being manufactured having been bought up in advance. Cylinder stock prices are holding firm, but the product is not moving very well. Sales of fuel oil are not nearly as good as refiners had expected during such cold weather. Kerosene continues to be the very weak point of the market. G.T.

THREE KILLED AND TWO HURT IN WELL EXPLOSION

ARDMORE, Okla., Feb. 23.—Edward Noonan, district superintendent of the Carter Oil Co. and widely known in the oil fields of the Southwest, and two other Carter company employes were killed and two workmen injured in an explosion yesterday on the Carter lease near Dillard, 18 miles from here. The other men killed were Isaac Robinson, a driller, and Forrest Beseaer, a helper, while those injured are Benjamin Goodjohn and Edward Luna.

The explosion occurred when the men were preparing to shoot the casing in an abandoned well. A charge of dynamite, being lowered into the well, exploded near the surface. The cause of the premature blast has not been ascertained, but oil men said it probably was due to an air hole at the top of the dynamite pipe being closed. It is said when the air hole is open, the charge is not easily set off until the fuse has burned.

NAMES TEXAS NEW OIL AND GAS SUPERVISORS

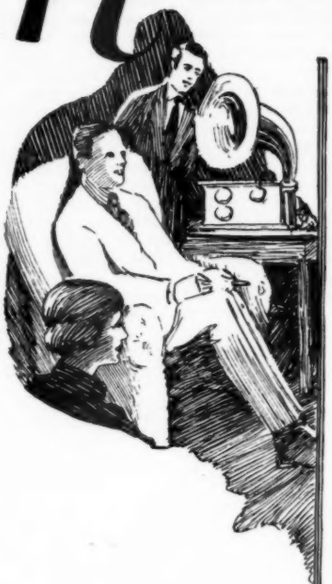
AUSTIN, Tex., Feb. 26.—Railroad commissioners appointed by Governor Neff Monday, effective March 1, constituting majority of the commission, and having supervision of the Oil and Gas Division and Gas Utilities Division, are: W. M. W. Splawn, professor of economics of the University of Texas, and W. A. Nabors, of Winnsboro, wholesale fruit and vegetable dealer. R. B. Walthal, now private secretary to Governor Neff, will be made chief of the Oil and Gas Bureau, it is understood, succeeding J. W. Hassell, resigned.

NEW FREIGHT RATES ADOPTED BY TEXAS R. R. COMMISSION

AUSTIN, Tex., Feb. 27.—The old petroleum products freight rates have been cancelled and a new schedule adopted by the railroad commission, according to an order issued Tuesday, covering maximum rates on petroleum and products to and from Porth Arthur and Galveston. It replaces the Wichita Valley and Southern Railroads' schedule of petroleum and petroleum products.

The new schedule is based on distances for carload shipments and ranges from 11 cents per hundred pounds single line, and 16 cents joint rate under 10 miles, up to 36 cents above 250 miles. B.

Recognition!



Both "Radio" and Oklahoma Paraffin Crude have won quick approval

Radio's development has been rapid. A few years of experimenting and doubting—then it sprang suddenly into the limelight of public recognition and interest. During the last year, especially, it has made almost phenomenal strides—and still it surges on!

Likewise the refining of high grade lubricants from Oklahoma Paraffin Crude has made rapid progress. For a short time after its discovery, skepticism as to its real lubricating quality retarded the development. But its unexcelled lubricating quality is now fast becoming generally known and accepted.

The last year, particularly, has seen widespread recognition of the high lubricating quality of oils made from Oklahoma Paraffin Crude. Now four-fifths of the country's supply of paraffin base lubricants originate in the section of Oklahoma from which Empire Paraffin Neutrals come.

Let us send you samples, specifications and prices of Empire Oklahoma Paraffin Neutrals. Check them up, point by point, with any other neutrals obtainable. You will immediately recognize their advantages from this close comparison. *Write, wire or phone our nearest office now.*

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SUBSIDIARY CITIES SERVICE CO.

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Said OMAR—

—I wonder often what the Vintners buy
One-half so precious as the stuff they sell.

Mysterious —Yet Simple!

Omar Khayyam's sincere tribute to the Vintners of his Dear Wine, voiced the usual mysterious attitude of appreciative buyers—"How can the maker consent to part with such good stuff?"

But the answer is very simple. Speaking for the Vintner, it was no doubt impossible for him to drink ALL of the wine he made—and he had to BUY a few other essentials. Speaking for ourselves, it is our policy to produce for jobbers exclusively. Some who have learned the true quality of Omar Products have wondered why we do not "buy our own stuff" and sell direct to retailer and motorist. But, we are content with supplying an ever-increasing number of appreciative jobbers.

Do YOU appreciate superlative quality? Then, let us quote you now on Omar Gasoline, Kerosene, Gas Oil or Fuel Oil.

Omar Refining Company

Main Office: Roberts Bldg., TULSA

BRANCH OFFICE:
Grand Theater Bldg., Columbus, Ohio

N. P. M. A. CONVENTION PROGRAM ANNOUNCED BY L. V. NICHOLAS

CHICAGO, Ill., Feb. 26.—All plans in connection with the convention of the National Petroleum Marketers Association, which will be held at the Chase Hotel, St. Louis, Mo., March 6, 7 and 8, have been completed, according to L. V. Nicholas, president of the organization. Pursuing the same policy in regard to the program, as was done in the October meeting last year, there will be no set speeches. All business sessions of the three days convention will be devoted to the informal discussion of problems confronting the membership. The afternoon meetings will begin promptly at 2 o'clock, with no forenoon sessions unless they are requested by members after the convention opens.

The entertainment features as previously announced, will be carried out. All railroads will have in effect a fare and one-half rate to St. Louis and return, and delegates are advised to secure certificates at the time they purchase their tickets, which will entitle them to half-fare on their return. Information received at the local headquarters indicate a large attendance at the convention.

Following is the program for the convention as announced today by President Nicholas:

First Day

Frank discussion, with some illuminating facts regarding the financing, functioning and general interference with your adopted and accepted Declaration of Independence and the National Advertising program and policies—the interests back of them—why they are back of them, and a general discussion as to whether we care to consider any change in the Assotion program or policies.

Second Day

A full presentation of the National Advertising Program, reasons for the delay in launching the National publicity and completed plans for the next six months. This will, incidentally, bring out a good deal of the fight and objection to the Declaration of Independence.

Third Day

Arguments and discussions regarding gasoline road taxes, inspection laws and various regulatory measures—are they National problems or are they strictly State problems?

Problems For Discussion

Following are some of the problems suggested for discussion, to which may be added other subjects in which you are interested:

1.—Does the carload marketer take profits which should go to the jobber?

2.—Do some refiners quote one price to the jobber and then notify a carload marketer to quote another, and if so, why?

3.—Did certain carload marketers who pay big salaries and paid big dividends last year do it on an eighth of a cent brokerage, or did they do it by manipulation which took a profit legitimately belonging to the jobber and to the refiner?

4.—National Co-operative Insurance. The big companies carry their own insurance at a greatly reduced cost. Collectively we can do the same. We have a great national co-operative body, located at Philadelphia, Pa., owned and controlled by its members. Many members of this association are officers and directors in this company, and we do not seem to be giving it the support we should. Is this because we have not heard about it, or are we overlooking a good thing? Let us talk it over.

5.—Time is reserved on the first day for a half hour presentation by any carload marketer of his objection to signing the Declaration of Independence, and why they believe the independent oil jobbers should buy Standard manufactured products sold by them. This announcement will be an invitation to the carload marketers to select their man and have him present at St. Louis on the first day, notifying this association in advance the name of their spokesman, so we can be prepared to show him every courtesy and allot him the time for the presentation of his subject.

6.—On the second day, it is proposed to ask the refiners who have not signed the Declaration of Independence to select a speaker to present their reasons for not signing, if they are independent, and in what way they feel the Declaration of Independence is dangerous to the independent oil industry. This will be an invitation to the refiners who have not signed the declaration to get together and choose a speaker to present their collective views on the subject.

Mr. Nicholas further said in the program: "Please understand that our reason for not addressing this invitation to either carload marketers or refiners direct, is because we want the invitation broadcasted in a way to be sure it is understood by all and leave no chance for its not being generally understood that the opportunity is afforded and freely offered if they care to take advantage of it. It must be further understood that this invitation is a sincere one and no speaker will be heckled or embarrassed, but will be treated with every respect and every courtesy possible. This organization has no desire to create enmities, but we want to face the facts."

REFINERY FIGURES FOR DECEMBER AND THE CALENDAR YEAR

WASHINGTON, D. C., Feb. 26.—The United States Geological Survey reports that the indicated domestic consumption of crude oil for 1922 was 586,359,000 bbls. Of this 500,703,000 bbls., both foreign and domestic, was run to refinery stills. This represents 85 per cent of the total, most of the remainder having been used for fuel without refining. Refineries operating had an aggregate capacity 12 per cent greater than the total consumption of crude oil.

The Bureau of Mines says the December production of gasoline was the largest month's output recorded, amounting to 585,049,677 gallons, which brought the year's production up to 6,202,234,313 gallons, an increase over 1921 of 20 per cent.

Present stocks of gasoline, 886,792,861 gallons, lack only 9,000,000 gallons of the peak stocks of last May, with four months yet of increasing stocks before reaching the peak of 1923. The present stocks represent 64 days' supply, based on present production.

The indicated domestic consumption of gasoline in 1922 was 5,366,426,822 gallons, an increase of only 200,000,000 gallons over 1921. Domestic consumption represented 86.52 per cent of domestic production.

WELL AT LONG BEACH BREAKS LOOSE; FLOWS 750 BBLS. AN HOUR

LOS ANGELES, Calif., Feb. 27.—The Petroleum Midway Co.'s No. 1 Ryder in the Long Beach Field broke loose from control at 7 o'clock Monday evening, February 26, and flowed at the rate of 750 bbls. an hour until capped at 4 o'clock the following morning.

The surrounding territory was literally drenched and the damage to property was heavy. Pumps were hastily installed and the company recovered approximately 10,000 bbls. of crude. The well had been flowing around 4,000 bbls. daily and it is reported that the momentary loss of control was caused by an increase in the size of the flow nipple, which resulted from sand eating away the fitting. L.P.S.

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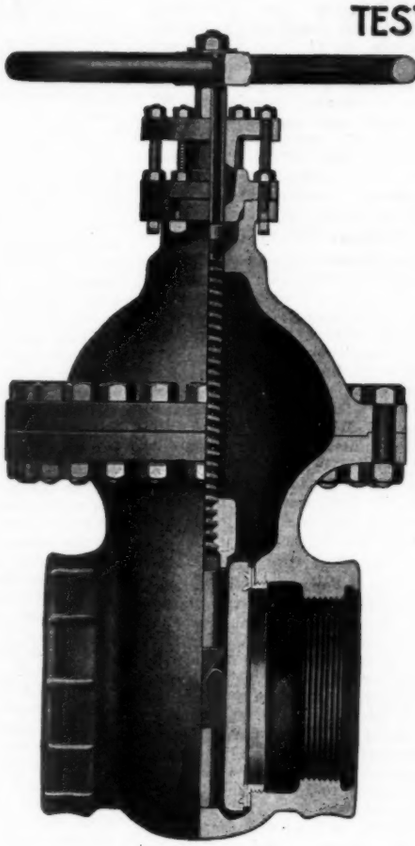
CAST STEEL DRILLING GATE VALVES

TESTED TO 2500 LBS.



LESS THAN HALF THE WEIGHT OF CAST IRON MORE THAN DOUBLE THE STRENGTH

The Chapman Valve Manufacturing Co.
Indian Orchard, Mass., U.S.A.

BRANCHES:

New York	Syracuse	San Francisco	Houston
Boston	Pittsburgh	Los Angeles	Atlanta
Chicago	Philadelphia	Cleveland	Tulsa

VALVES

John Jones (1890)

John Jones is healthy enough, mentally and physically.

But he can't ignore the fact that some day the blank date will be filled out after his name in the old family Bible, and his insurance company called in to pay off their bet.

In the meantime John Jones is a busy man. Honest with himself, and inclined to philosophize, he probably subscribes to the words of Glen Buck:

"I do not particularly want the greatest good for the greatest number. I want the greatest good for me. And to others I concede the same right."

In other words, John Jones is a typical average man, absorbed in the business of looking after John Jones.

Consider, then, what kind of a sucker rod a sucker rod must be, which, on December 8, 1922, moved John Jones to pause in the midst of his activities as an executive in a great producing oil company and dictate the following letter:

"Three years ago, when production was at its peak, we were having considerable trouble with our sucker rods crystallizing and breaking, causing us great loss in production.

"Requests to the manufacturers to put forth better quality rods brought no response. Fortunately about that time I heard of the Axelson Machine Company's sucker rods, and ordered 5,000 feet for test purposes, which were delivered immediately.

"Three years have passed, and today we have over six carloads of Axelson sucker rods in use on our wells near ----------, and every sucker rod has paid for itself within three months. Most of these wells are being operated 24 hours per day.

"Axelson surface rods have also stood the test, and to cite one instance we have five powers that were equipped with the above surface rods in October, 1921. To date not one of these surface rods has broken or caused any trouble.

"After using Axelson products for the past three years, I take this opportunity of recommending the above products to any man who is having trouble and loss in the production of oil."

Frick-Reid Supply Company

Tulsa, Okla. *Pittsburgh, Pa.*

Supplies FR Service

FOR THE OIL FIELDS

Stores in All Principal Fields

NEW NAVY IS FIRM IN CHICAGO BUT MARKET GENERALLY INACTIVE

By Ralph Anschuetz

CHICAGO, Ill., Feb. 26.—Although New Navy gasoline, towards the close of the week, was very firm at 15 to 15¼ cents, there has not been a very active market, due to the fact that the jobbers have large supplies on hand, and due, perhaps, to the unsatisfactory weather. On Monday and Tuesday of the past week, it was possible to secure 58-60, 437 end point gasoline, en route, at 13¾ to 14 cents, but careful inquiry as to prices over the past few days of the month indicated that the price would be advanced to the present markets, as it has. The jobbers in this territory feel that another tank wagon increase should soon be made, but this will be dependent upon the fluctuations in crude over the next week. Another increase in Mid-Continent crude will undoubtedly be reflected in further tank wagon advances.

Fifty-six-fifty-eight 450 end point gasoline has been increased by refiners and marketers to 14 and 14¼ cents, Group 3, covering fairly prompt shipment. The higher gravity gasolines have been more in demand, especially 60-62, 400 end point gasoline, which ranges from 16½ to 16¾ cents. Naphtha Blend is being quoted from 13¼ to 13½ cents. There is a good business in absorption and compression natural gasoline, and shipments are being made promptly.

Kerosene Still Weak

Plenty of kerosene may be obtained in this district at good prices. This product is still very weak in demand, but several marketers in Chicago have been concentrating their efforts to dispose of this product to the jobbing trade, and have met with surprisingly good results, and indications point to much better prices over the next few weeks. Forty-one-forty-three, W. W. kerosene ranges from 4⅝ to 4¾ cents, based on Group 3; while 42-43, W. W. kerosene is being quoted at 4¾ to 5 cents. However, the limit that the marketers seem to be able to secure for kerosene is 5 cents and that for prompt shipment.

Fuel Oil

Fuel oil has shown an advance of 5 cents per barrel over the past week, and there is a good demand for this product. Last week one of the local marketers sold 40 cars of 24-26 fuel to a consumer at $1.07½ per barrel, but now the marketer is paying that price for fuel for prompt shipment, and the quotations to the consuming trade run from $1.10 to $1.15. Several of the prominent refiners' representatives and local marketers have been attempting to secure fuel in large quantities, but the price has not been right for them to step into the market. Chicago oil concerns which deal in the tank wagon delivery of fuel oil, distillate and gas oil for burners decided this week, that the advances in crude and fuel oil would force them to slightly increase the prices on less than tank wagon deliveries, and accordingly new prices will be announced to the burner trade, consistent with the increase in the price of fuel oil.

Gas Oil

A brisk demand the early part of last week advanced 32-36 gas oil ¼ of a cent to 3½ to 3¾ cents, Group 3. The large users of gas oil have shown an inclination to make purchases in the market, and the activity immediately reflected in a slight advance. Straw color distillates are very firm.

Road Oil

More has been heard from the buyers of road oil this season than from the refineries and marketers, and present indications seem to show that road oil will be scarce in the spot market. It is even difficult to secure an accurate line on the prices of this product at this stage of the year. It was at first reported that Cosden & Co. would not run any road oil this year, but late reports state that this concern will run road oil, but have sold their entire output under contract, and will therefore not be in the market.

The crude situation is not yet determined, and it is the belief of the trade that further advances may be expected. Several refiners who have plants in the Chicago territories have been anxious over their crude supply, and have made inspection trips through the fields in an effort to keep their storage lined up, so the future is still a bit cloudy for them. The present tank wagon prices are still considered inadequate by the jobbing trade, when taking the present refinery prices into consideration.

NORTH TEXAS MARKET REMAINS VERY QUIET

By Staff Correspondent

FT. WORTH, Tex., Feb. 26.—There is little, if any change, in marketing conditions in the North Texas refining area as compared with a week ago.

The refining business in this section is almost at a standstill, comparatively speaking, because of the high price refiners must pay for crude and the low price at which they are able to sell their finished products. A number of plants in this territory are shut down and many others have reduced their daily crude runs until they can at least break even on operations.

There are occasional small quantities of 58-60 New Navy gasoline available at slightly below 14 cents, usually from brokers who have purchased for advance shipment, but the general refinery market is around 14½ cents, with some sales managers quoting from ½ to 1-cent higher. Other straight run grades of higher and lower gravities are maintaining about their average differential above or below New Navy. Naturally, because of the uncertainty of tank wagon markets and the necessity for refiners to ask really more than many of the tank wagon markets justify, business is rather slow.

Blending materials such as natural gasoline and naphtha are following pretty well in the footsteps of the straight run products, although the demand from a blending standpoint, is not quite so good. There is very little demand for blending gasoline, except from jobbers who push that particular grade and make it a standard product. In respect to natural gasoline, there is enough demand from refiners to insure a fairly good movement right along, and consequently stocks are just about normal. Naphtha, on the other hand, is somewhat more plentiful and the demand from blenders is far from heavy, but as there is a comparatively small quantity of this product manufactured in this territory and considerable of that moving on contract, stocks are not particularly heavy.

Gas oil continues to show improvement, both in price and demand, due to the scarcity of that product, rather than heavy buying. Many North Texas refiners are not manufacturing gas oil at all, but are letting it go into their fuel oil, which method of handling accounts, in part, for the shortage of this product.

During the past week there have been several good-sized fuel oil inquiries, approximating 500 cars over the next month or two. Up to the present time, the orders have not been placed in their original quantities, due to the difference of price opinion between the buyer and the seller. One of the purchasers in particular, has in mind securing several hundred cars as far in advance as three months at a flat price of $1 per barrel f. o. b. refinery.

Hancock
ANTI-SAND
Working Barrels

A simple and practical pumping device that has proven highly efficient under the most strenuous operations.

Prevents sand from cutting cups, will handle the same amount of fluid as standard equipment and posesses sand pockets with capacity many times greater than any other device now being manufactured for the same purpose. Our guarantee assures you satisfaction.

50% to 90%

Reduction in your pulling expenses.

As easy to install as a common steel barrel.

For Sale at Supply Stores
Or Prompt Shipment from Factory

Hancock Working Barrel Co.

Phone Cedar 1870 Tulsa, Oklahoma 228 Mayo Bldg.

The OIL and GAS JOURNAL

PRODUCING REFINING MARKETING

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OPTIMISM PERVADES GROUP 3 OIL MARKET

(Continued from page 54)

pay does not coincide with most of the refiners' idea on what March quotations should be. Apparently this company is not interested in New Navy at the present time or in fact, are any of the exporting organizations, as the spot market is too high in comparison with export conditions; 60-62-400 end point and 64-66 375 end point gasolines are not reflecting the price advance of New Navy. Refiners are asking 17½ cents for what quantity of the latter material they are willing to quote over March, but with spring at hand most of them are not very anxious to make this grade unless they can receive a particularly attractive price, so it is thought in well informed circles that this product will see a higher level in the near future. Naphtha has been advanced from 14 cents to 14¾ cents by the leading refiners and in most cases they are actually maintaining their quotations regardless of sales.

Natural Gasoline and Blends

Natural gasoline prices are up from one-quarter to one-half a cent from last week's level and the situation of this product is in most respects the same as that existing in the case of straight run. The larger manufacturers are holding their prices and the product of the smaller plants is moving under the prevailing quotations with one or two cases of exceptional price concession. One of the large refining organizations which has been purchasing quite heavily recently has withdrawn from the market and states that it will not need to buy any further material for 90 days unless a bargain is offered. There is not much demand for blends, but with naphtha prices at their present level, blenders are forced to get fairly good prices and are only purchasing enough naphtha to meet their immediate needs.

Burning Oils

Kerosene is unchanged in price or demand, though some small quantity is being sold below current quotations by smaller concerns who are in need of immediate shipping instructions. The Union Petroleum Co. continues to buy a little here and there for export, but the quantity is insignificant. Distillates are in good demand with householders apparently using a considerable amount for heating purposes.

Neutrals

The demand for lubricants does not seem to be quite so insistent and refiners report a little buying lull but seem to welcome an opportunity to accumulate a little stock. Prices are unchanged. Bright stocks are very active. One of the large marketing organizations is shipping this product from the New England States to the Pacific Coast and a small quantity is going to export. Stocks are low and there is some talk of prices being advanced.

Fuel

After months of dickering, refiners with Santa Fe contracts have at last adjusted them in conformity with the new method of crude purchases when the Prairie Oil & Gas Co. announced the grading of crude, the Mid-Continent fuel oil market was thrown into a turmoil as the bulk of fuel output in this territory moves under contract to southwestern railroads, of which the Santa Fe is the largest consumer, using in excess of 10,000 bbls. a day. All of these contracts stipulated 60 per cent of the posted price of Mid-Continent crude as posted by the Prairie Oil & Gas Co.

Following a personal visit of the purchasing agent of the Santa Fe to Tulsa during this week, this carrier has now adjusted its contracts with Cosden and others on a basis of 80 per cent of the $1.40 grade at the time crude was graded. This means refiners on the present crude structure are receiving $1.20 per barrel for their fuel. While the Katy Railroad has taken no definite action, it is expected to follow the lead of the Santa Fe as it has given refiners to understand that whatever basis is satisfactory to the latter road would be agreeable to it.

In the case of the Frisco, refiners with contracts with this road are still far from an agreement. The Frisco maintains that the contract clause (the presence of which, incidentally, many refiners were ignorant of until crude was graded) stipulates that the price paid by the Prairie for 34 gravity is the basis upon which it will settle. Such an adjustment would net back to refiners on the present crude market $1.11 per barrel. Several plants are accepting payment on this basis with the understanding that such a price is accepted under protest and will not be prejudicial to future actions.

Clarification of the carrier controversy is expected in some quarters to have a stimulating effect upon fuel prices. A survey made by one of the marketing organizations of the Oklahoma situation discloses that practically all of the smaller plants in the State are moving their output locally to power plants and small industrial concerns, etc., which with the increased takings of the railroads, which are understood to be buying more fuel than ever before, leaves very little of this product open for the spot market. Spot prices, while unchanged, are firm and it is difficult to find 25 cars for immediate shipment at $1.05. Gas oil is in just about the same position it has occupied for the last month. Prices are unchanged and demand is routine.

Road Oil

Inquiries have been particularly heavy for road oil during the past few weeks with the call apparently being for 60 to 70 asphaltic content grade, but as there are only a few refiners who are making this grade of material it is rather difficult to obtain. If the car situation means anything at all to a refiner with fuel at its present price they cannot afford to make road oil unless they receive the proper price inducement. Most concerns making this grade are asking $1.50 per barrel, while the 50 to 60 grade is being quoted at $1.30 to $1.40. There are several concerns looking for from 200 to 500 cars, but to date none of this business has been closed.

OUTSIDE TESTS AT TONKAWA ARE ATTRACTING ATTENTION

The two outside wells now attracting most attention in the Tonkawa District (Oklahoma) are the Comar Oil Co.'s No. 1 1Koppenbring, SW cor. Section 36-25-1w, and Manahan and others' No. 1 Gardner, SE cor. SW Section 28-25-1w. Production in the Koppenbrink well would mark an extension of the pool northeast, while the Gardner test is a mile northwest of the Marland Oil Co. and the Cosden Oil & Gas Co.'s No. 1 Wood.

The Comar Oil Co. had a show of oil in broken sand at 1,854-63 feet in the Koppenbrink well, but drilled into salt water in sand at 1,947-59 feet. The company is drilling deeper and carrying the pipe. The well is on a quarter section purchased recently from the Wrightman Oil Co., for approximately $1,000,000. The Skelly Oil Co. has purchased a half interest in the Manahan well and the S half of SW, Section 28-25-1w, from Manahan and others, and will take over the management of the property soon. The operators were underreaming at 1,750 feet Monday, February 26.

The outcome of these two tests will have a significant bearing on the approximate definition of the limits of the pool northeast and northwest.

RAILROAD TO USE OIL

CASPER, Wyo., Feb. 24.—The Great Northern Railroad is preparing to burn oil on its engines on the divisions near the Sunburst Field and will discontinue the use of coal. This decision was reached after the railroad engineers had made several tests with oil as a fuel and the railroad considers that the tests show conclusively that oil will be the more economical motive power.

KELLY & JONES

extra heavy Hydraulic straight-way VALVES

BRASS STEMS, Hard Metal Seat Rings, Semi-steel Discs faced with Hard Metal and other similar features are characteristic of the construction of Kelly & Jones Extra Heavy Hydraulic Straight-Way Valves for high pressure service.

Hundreds of these valves have been giving dependable, uninterrupted service in all fields for many years and are regarded as standard equipment by leading producers and refiners.

Why not specify them for your high-pressure requirements?
Descriptive catalog sent on request.

THE KELLY & JONES CO.

WORKS - GREENSBURG, PENNA.

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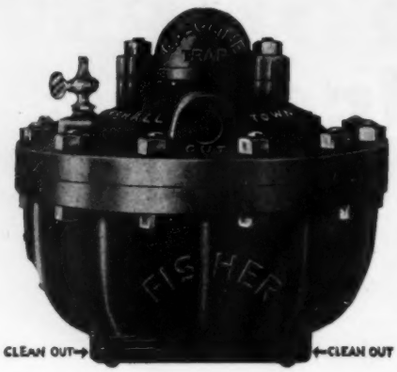


No Job Too Hard For the Fisher Gasoline Trap

A Gasoline Trap handling gasoline from compressor lines or accumulators must be strong. The FISHER TRAP is carefully constructed to meet this demand. A hydraulic test of a stock FISHER GASOLINE TRAP proved its ability to withstand 1600 lbs. per square inch before showing any crack.

FISHER GASOLINE TRAP

will quickly and thoroughly remove condensation from compressor lines and accumulator tanks.

All parts are extra heavy. Body and cover are made of high-grade cast iron and are heavily ribbed to give additional strength.

The bucket is unusually large. Being made of aluminum, and operating on a hinge of wide bearing, it insures positive, rapid opening and accurate closing of the valve.

The forceful intermittent discharge creates a pumping effect on the line and prevents accumulation of gasoline in pockets of pipe lines. This trap is equipped with a specially constructed valve and valve seat, which reduces the liability of freezing.

Send for Bulletin 1501—It tells all about FISHER Oil Field Specialties

The Fisher Governor Company

340 Fisher Avenue Marshalltown, Iowa

Agencies in All Principal Cities

FEBRUARY FIELD WORK SHOWS SLUMP

(Continued from page 46)

CENTRAL OHIO

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rigs	Drg.	Ttl.
Licking	1	0	1	0	0	0	0
Knox	5	16	0	3	3	9	12
Ashland	0	0	0	0	2	4	6
Medina	6	0	2	4	3	19	22
Lorain	0	0	0	0	0	7	7
Wayne	6	0	3	3	4	14	18
Richland	0	0	0	0	1	0	1
Vinton	1	0	1	0	2	0	2
Hocking	0	0	0	0	1	2	3
Holmes	4	5	1	2	9	12	21
Jackson	1	0	1	0	1	6	7
Coshocton	0	0	0	0	1	1	2
Athens	1	0	0	1	1	1	2
Meigs	0	0	0	0	1	1	2
Gallia	1	0	1	0	2	0	2
Total Feb.	26	21	10	13	31	76	107
Total Jan.	70	109	24	36	35	79	114
Difference	44	88	14	23	4	3	7

February was a poor month in the Central Ohio Field, owing to bad weather conditions. Few completions were reported in even the active counties, such as Holmes, Knox, Medina and Wayne. The months' work totaled 26 new wells, with 10 dry holes, 13 gas wells, and 3 oil wells, showing a new production of 21 bbls. Two of the oil wells were in the shallow Berea sand field of Knox County, and the other in Holmes County. At the close of the month there were 31 rigs up and building and 76 wells drilling against 35 rigs and 79 drilling wells at the close of January, a net decrease of 7, which is not bad considering conditions.

The important test of the month was the well drilled by the Empire Gas & Fuel Co., on the John Mossholder, in St. Albans Township, Licking County, which encountered the top of the Trenton at 3,240 feet, and salt water at 3,950 and 4,010 feet. It was drilled to a total depth of 4,038 feet, where the hole filled up so rapidly with water that it was abandoned.

KENTUCKY-TENNESSEE

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rigs	Drg.	Ttl.
Wayne	3	0	3	0	0	5	5
Powell	4	25	2	0	0	6	6
Estill	4	20	1	0	0	5	5
Lee	1	20	0	0	0	5	5
Lawrence	1	3	0	0	0	3	3
Allen	30	540	10	0	0	53	53
Warren	23	474	6	0	0	63	63
Barren	1	10	0	0	0	7	7
Simpson	5	3	3	1	0	8	8
Logan	3	0	3	0	0	0	0
Johnson-Magoffin	35	786	0	7	0	48	48
Cumberland	2	0	2	0	0	34	34
Monroe	1	100	0	0	0	12	12
Owsley	4	5	1	2	0	2	2
Hancock	3	36	0	0	0	4	4
McLean	1	0	1	0	0	1	1
Daviess	1	0	1	0	0	1	1
Russell	2	10	0	0	0	5	5
Clarke	1	0	0	1	0	0	0
Tennessee	6	105	4	0	0	12	12
Mississippi	0	0	0	0	0	11	11
Miscellaneous	0	0	0	0	0	25	25
Total Feb.	131	2,137	37	11	0	310	310
Total Jan.	176	2,086	54	4	0	307	307
Difference	45	51	17	7	0	3	3

Bad weather brought about a slump in development work in all parts of Kentucky during February. The Johnson and Magoffin County Field is coming fast and during the month the initial production was the greatest of any field in the State, although Allen and Warren, listed as one field, would show greater than the eastern Kentucky area. The bulk of the development reported from Johnson-Magoffin Fields in eastern Kentucky indicates that the Union Gas & Oil Co., is at the head, with numerous excellent producers and the oil comes from sands well known for their long staying production, making the field really the best proposition in Kentucky, from a financial standpoint, although the sands in the western Kentucky fields below the shale are maintaining their production far above expectations. Warren, Allen, Simpson and Barren Counties are in for an active drilling campaign, just as soon as weather conditions warrant. Much wildcatting is planned and new pools are almost a certainty, and the same conditions prevail over the entire eastern portion as well as in the central part of the State.

During February, a total of 131 wells were completed in Kentucky-Tennessee, with 37 dry holes, 11 gas wells and an initial production of 2,137 bbls. When compared with the January figures this shows a decrease of 45 in completed wells, 17 fewer dry holes and 7 more gas wells, and the new production is 51 bbls. greater.

In new work there is a slight gain for February over January. At the close of February, 310 wells were drilling against 307 for February, a gain of 3.

LIMA FIELD

Summary of Field Operations

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Wood	8	294	0	2	9	11
Hancock	6	141	0	1	8	9
Allen	4	35	1	0	3	3
Auglaize	3	72	0	0	5	5
Sandusky	3	15	0	1	2	3
Mercer	1	2	0	1	4	5
Van Wert	2	43	0	0	3	3
Seneca	2	65	1	0	4	4
Lucas	2	60	0	0	1	1
Ottawa	2	25	0	0	3	3
Darke	5	140	0	0	11	11
Wyandotte	0	0	0	0	1	1
Total Feb.	38	892	3	5	54	59
Total Jan.	33	705	9	9	50	59
Difference	5	187	7	4	4	0

The Lima Field of northwestern Ohio recorded an all around increase for February work with the exception of dry holes, which showed a decrease. There were 38 wells completed, 2 dry holes and 892 barrels new production, which, when compared with the January report shows an increase of 5 in completed wells and 187 barrels in new production, while there was a decrease of 7 in dry holes. New work under way at the close of February show 5 rigs up and 59 wells drilling for a total of 64, while the close of January had 9 rigs up and 50 wells drilling, a net increase for February over January of 5.

The bringing in of two century wells in the Bowling Green section of Wood County, brought about the increase in new production. These wells were drilled along what is known as the "hogsback," a formation like a structure running through from the Haskins Field south and a little east through Mungen, thence across Wood County into Hancock County to the east of Findlay. Along this structure, which is hardly noticeable from surface indications the producing sand found is considerably higher than spots either west or east, and is very narrow in width, but usually in the older ways when the drill passed into this "hogsback" the result was an excellent producer.

INDIANA

Summary of Field Operations

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Jay	3	20	2	0	6	6
Huntington	1	10	0	0	0	0
Delaware	2	69	1	0	1	1
Gibson	0	0	0	0	6	6
Pike	2	10	1	0	6	6
Sullivan	1	4	0	0	2	2
Knox	2	55	0	0	4	4
Wabash	0	0	0	0	0	0
Wells	0	0	0	0	1	1
Wayne	0	0	0	0	1	1
Warrick	0	0	0	0	1	1
Vigo	0	0	0	0	2	2
Total Feb.	11	159	4	0	30	30
Total Jan.	10	303	1	0	34	34
Difference	1	144	3	0	4	4

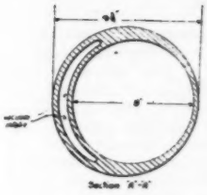
During February 11 wells were completed in Indiana, with 4 dry holes and a new production of 159 bbls. In January there were 10 completions, 1 dry and 303 bbls. new production.

The really important development of the month was the completion of two producers in Harrison Township, Knox County, that may mean a more active drilling campaign with improved weather conditions. One of the wells produced 40 bbls. and the other 15 bbls., both being tests. The bringing in of a 60-bbl. well by George P. Mets, in his second well on the Dave Michaels farm, in Delaware Township, Delaware County, shows that the old Muncie Field still contains commercial production.

Weather conditions brought about a slight slump in new work, for at the close of February, but 30 wells were drilling against 34 for January.

Standardize Your Tankage With a Safety Valve and Thief Hole Device

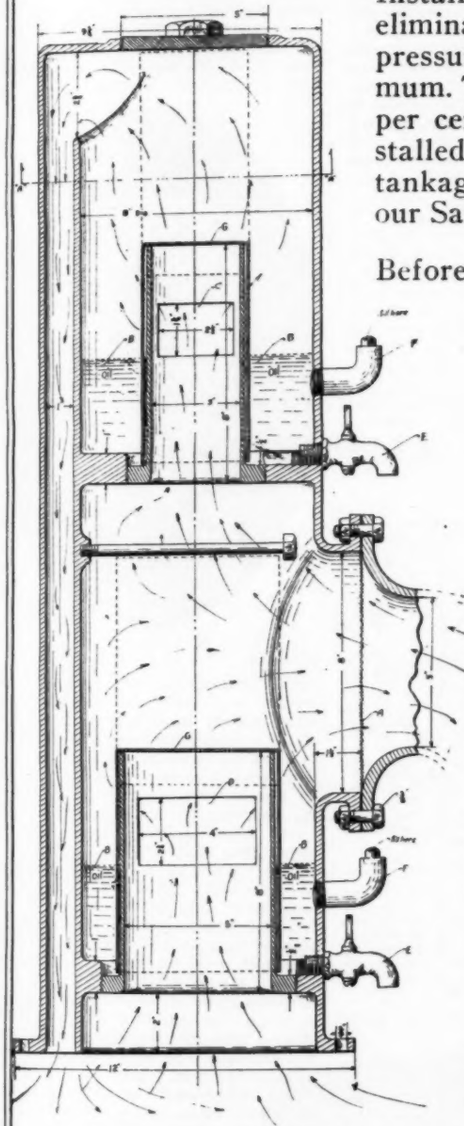
Gravity Losses Now Mean a Loss of Dollars to you—A Safety Valve and Thief Hole Device Prevents Loss from Evaporation



PROFIT by the experience of the operator who has installed our equipment. It has been demonstrated that the saving in evaporation alone soon pays for a safety valve and also adds to your profits while paying its own way. Hot weather will soon be here—don't wait—

Install a **Safety Valve and Thief Hole Device** on your tankage now. It eliminates evaporation, insures safety against a tank being blown up by pressure or collapsed by vacuum, and reduces fire hazards to a minimum. Tanks equipped with our Safety Valve and Thief Hole show a 98 per cent reduction in loss by evaporation. Producers who have installed our appliances send in repeat orders unsolicited when additional tankage is to be erected. May we send you a list of producers using our Safety Valve?

Before you place your order for additional tankage, investigate the merits of our Safety Valve and Thief Hole and make it a part of your contract.



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B—Liquid Chambers
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G—Vent Can

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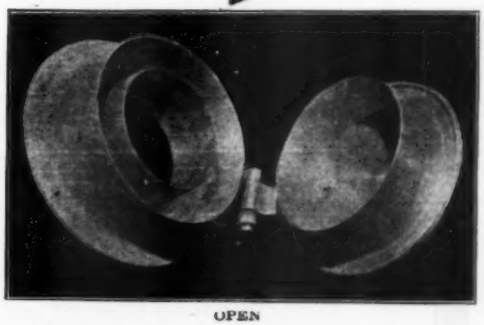
In operation, the cover is raised by means of a lever, controlled by the foot of the operator. When the operator's foot is removed, the cover automatically closes, the projection of the cover entering the recess of the body section, which is filled with liquid, preventing the passage of vapors.

Insist that your tanks are equipped with the Petroleum Safety Valves and Thief Hole Device.

Outer and inner walls form recess providing absolutely dependable liquid seal



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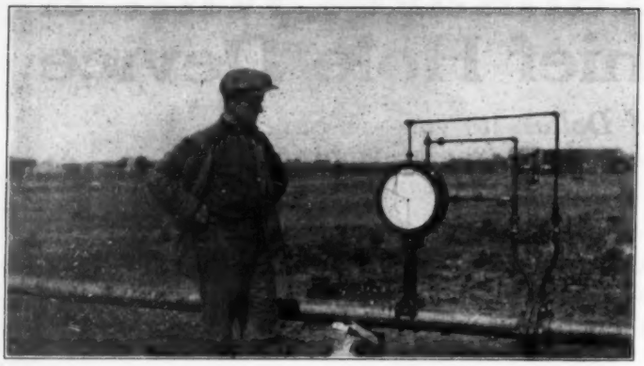
Name .....

Street .....

City .....**State** .....



"Accurate and Fool-proof"

Mr. Ira L. Neely, General Manager of The Medina Gas and Fuel Company, says:

"The Medina Gas & Fuel Company, The Columbus Natural Gas Company, The Berea Pipe Line Company, The Empire Gas & Fuel Company of Ohio, The Buckeye State Gas & Fuel Company and The Coshocton Gas Company, all operating from this office, are using Foxboro Orifice Meters and if we knew of any better gas measuring device, we would not be using them at the present time. We have found them as near fool-proof as it is possible for a device of this kind to be made, and if kept properly checked, are as nearly accurate as it is possible at the present time to make a high pressure gas measuring device."

That many large oil and natural gas companies hold to the same opinion is demonstrated by the fact that they use only Foxboro Orifice Meters.

We make Orifice Meters, Recording and Indicating Thermometers and Gauges for use in connection with:
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Natural Gas
Stills
Condensers
Super-heaters
Agitators
Wax Heaters
Refrigerators
and for the
Power Plant

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ILLINOIS

Summary of Field Operations

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Clark	4	148	0	0	10	10
Cumberland	0	0	0	0	1	1
Crawford	5	14	2	0	5	5
Lawrence	1	40	0	1	1	2
Marion	6	170	2	0	3	3
Clinton	1	50	0	0	1	1
Washington	0	0	0	0	0	0
Jefferson	0	0	0	0	0	0
Edwards	1	0	1	0	1	1
Jackson	2	0	2	0	1	1
Wabash	3	250	2	0	5	5
Macon	0	0	0	0	1	1
Monroe	0	0	0	0	6	6
Alexander	0	0	0	0	1	1
Jasper	0	0	0	0	1	1
Henderson	0	0	0	0	2	2
Morgan	0	0	0	0	1	1
Total Feb.	23	672	9	1	40	41
Total Jan.	27	740	14	1	38	39
Difference	4	68	5	0	2	2

During February 23 wells were completed in the Illinois fields, with 1 gas well, 8 dry holes and a new production of 672 bbls. When compared with the January figures this shows a decrease of 4 in completed wells, 68 bbls. less production and 5 less dry holes.

The important well of the month was developed in the Wabash County Field, in Friendsville Township, which extended the producing area of the new pool close to a mile northerly. This well was drilled by John Phipps and others of Robinson, on the Mary Litherland, and shows 250 bbls. This is destined to be an active development as soon as the weather will permit the moving of material, which is only a few miles removed from the town of Allendale.

The stray sand development in Martinsville Township, Clark County, is another attractive development, the pay being found at a depth close around 1,500 feet, and a shallower sand at around 700 feet, while the Trenton is known to be productive at around from 2,400 to 2,700 feet, giving the area three sands to draw from.

At the close of February there was 1 rig up and 40 wells drilling, against 1 rig and 38 drilling wells at the close of January, a net increase of 2.

WYOMING

Summary of Field Operations

District—	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Big Muddy	1	300	0	0	9	9
Salt Creek	17	4,045	2	45	87	132
Lance Creek	0	0	0	0	7	7
Warm Springs, Grass Creek, etc.	0	0	0	3	12	15
Big Horn Basin	2	0	0	4	17	21
Lost Soldier	2	3,500	0	10	44	54
Rock River	2	350	0	8	25	33
Fremont County	0	0	0	10	21	31
Mule Creek	0	0	0	1	11	12
Osage	6	225	0	3	28	31
Natrona County	0	0	0	3	18	21
Lincoln County	0	0	0	2	19	21
Baxter Basin	0	0	0	2	11	13
Miscellaneous	0	0	0	16	45	61
Total Feb.	30	8,420	2	107	354	461
Total Jan.	21	6,300	2	152	469	621
Difference	9	2,120	0	45	115*	160

New gas production, 51,000,000 feet.
*Many old rigs and long shut down wells dropped from report as abandoned.

Montana

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Cat Creek	1	150	0	0	31	31
Kevin-Sunburst	5	610	0	26	33	59
Miscellaneous	0	0	0	7	97	104
Total Feb.	6	760	0	33	161	194
Total Jan.	7	890	1	30	168	198
Difference	1	130	1	3	7	4

Gas production, 3,000,000 feet.

Utah

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Miscellaneous	0	0	0	1	21	22

No change since January.

The apparent falling off in work in the northwest territory does not represent an actual decrease in activity, any more than usual in this season of the year. A large number of operations have been dropped from the list as active work long since ceased at these locations and may never be resumed, and in a number of instances rigs erected several years ago have been removed. The tests were never officially reported as completed, nor the holes abandoned, so that they can not be considered dry holes. In addition to this, the conservation program in the Salt Creek area has practically put a stop to new operations in that district, while a number of wells are completed each month.

Thirty wells were completed in Wyoming in February, with a total initial production of 8,420 bbls. The dry holes numbered 2. In January there were 21 completions, 6,300 bbls. in new production, and 2 dry holes. Fifty-one million cubic feet of gas was opened up by the drill. In Montana 6 completions furnished 760 bbls. of initial production, while in January 7 completions showed 890 bbls. of new production. There were no completions in Utah.

EL DORADO REFINERY BOUGHT BY IMPERIAL

Announcement was made during the past week that the Kettle Creek Refining Co. has purchased the refinery of the Red River Refining Co., located at El Dorado, Ark. The Kettle Creek Refining Co. was recently organized as a Delaware concern with an authorized capitalization of $600,000. W. B. Hassett, widely known among the oil fraternity as president of the Imperial Refining Co. of Ardmore, Okla., and the Great Southern Refining Co. of Lexington, Ky., is president of the new concern. C. L. Mayhall, who is vice president and general manager of the Imperial Refining Co., has the same connection with the new concern. The other officers, directors and stockholders of the company are largely the same as those of the Imperial Refining Co., with the exception of several producers in the El Dorado area, who are interested in the company.

W. B. HASSETT

The Imperial Oil Marketing Co., of which Mr. Mayhall is president, will market the output of the refinery located at El Dorado. This organization has for some time marketed the output of the Imperial Refining Co. The El Dorado plant at present, has a capacity of 1,500 bbls. and plans have been completed to increase this to 4,000 bbls. at once. The Ardmore plant of the Imperial company is to be enlarged from 5,000 to 6,000 bbls. so that the marketing organization will handle a total output of 10,000 bbls. daily in the near future.

The enlargements to be made at the El Dorado plant include 500,000 bbls. of crude and refined storage. O. B. Longino is superintendent of the plant. The general offices of the company will be with the Imperial Refining Co. and the Imperial Marketing Co. at Tulsa.

STROUD RESIGNS OFFICE

SHREVEPORT, La., Feb. 26.—Ben K. Stroud has resigned his position as head of the mineral division of the Louisiana Conservation Commission and has accepted an offer from the National Tube Co. to take charge of its recently established engineering department with headquarters at Los Angeles.

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OKLAHOMA-KANSAS AND EASTERN PIPE LINE REPORT FOR JANUARY

OKLAHOMA-KANSAS
Pipe Line Statement for January

Runs

Company—	Month	Daily Av.
*Prairie Pipe Line Co.	4,340,000	140,000
The Texas Co.	544,618	17,568
Gulf Pipe Line Co.	1,192,107	38,454
Empire Pipe Line Co.	963,882	31,093
Magnolia Pipe Line	760,047	24,518
Cosden Pipe Line Co.	1,038,584	33,503
*Sinclair Pipe Line	1,470,100	47,423
*Other lines	5,381,600	173,600
Total Jan.	16,690,938	506,159
Total Dec.	15,584,119	502,391
Difference	106,819	3,768

Shipments

Prairie Pipe Line Co.	†5,085,840	164,057
Gulf Pipe Line Co.	896,860	28,931
The Texas Co.	766,753	24,734
Magnolia Pet. Co.	763,407	24,626
Empire Pipe Line Co.	1,034,287	33,344
Cosden Pipe Line Co.	1,153,431	37,207
Sinclair Pipe Line Co.	†1,038,401	36,723
*Other lines	5,381,600	173,600
Total Jan.	16,120,579	523,222
Total Dec.	16,065,932	517,933
Difference	54,647	5,289

*Estimated. †Includes shipments from Texas.

Stocks

*Prairie Oil & Gas Co.	21,500,000
Prairie Pipe Line Co.	1,500,000
The Texas Co.	5,971,487
Gypsy Oil Co. and Gulf P. L. Co.	6,377,252
Magnolia Pet. Co.	6,698,495
Empire Pipe Line Co.	1,931,995
Cosden Pipe Line Co.	1,433,047
*Sinclair Crude Oil Purchasing Co.	25,000,000
Carter Oil Co.	16,181,459
Outside lines	2,600,000
Total Jan.	89,193,735
Total Dec.	89,091,277
Difference	102,458

*Estimated.

Stocks do not include approximately 4,775,000 bbls. of stock held in storage on private tank farms and leases.

EASTERN FIELDS

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for December and January:

	Dec., '22	Jan., '23
Nat. Transit	205,658.56	218,403.02
S. W. Pa. P. L.	85,343.99	93,073.39
Eureka P. L.	442,832.18	379,127.65
Buckeye P. L. (Macksburg)	270,955.41	281,754.23
Buckeye P. L. (Cleveland)	21,203.90	22,074.09
Buckeye P. L. (Lima, etc.)	107,527.65	124,560.81
Indiana P. L.	14,390.06	17,402.88
Cumberland P. L.	321,396.28	391,358.03
N. Y. Transit	13,166.41	15,823.89
Tide Water P. L.	150,540.48	153,371.93
Pure Oil P. L.	179,093.11	174,110.42
Emery P. L.	35,083.86	35,831.35
Paragon Ref.	54,628.26	12,951.74
Indian Ref.	361,454.11	373,033.72
Swiss P. L.	.....	1,235.52
Pittsburgh P. L.	10,396.96	10,713.53
Riggs Ref.	.....	6,500.00
Paragon Dev.	.....	38,070.89
Total	2,273,871.22	2,349,497.09
Daily average	73,350.68	75,790.22

Note—Indian Refinnig Co. also reported other receipts of 171,275.22 bbls., Paragon Refining Co. had other receipts of 83,949.42 bbls. Paragon Development Co. had other receipts of 6,920.39 bbls.

Petroleum Deliveries

	Dec., '22	Jan., '23
Nat. Transit	435,813.35	578,742.72
S. W. Pa. P. L.	287,976.94	262,253.74
Eureka P. L.	135,868.37	128,984.51
Buckeye P. L. (Macksburg)	72,695.79	66,047.69
Buckeye P. L. (Cleveland)	1,300.85	1,257.11
Buckeye P. L. (Lima, etc.)	866,902.88	765,841.15
Indiana P. L.	1,023,962.19	1,166,503.80
Cumberland P. L.	112,961.81	125,656.31
Southern P. L.	138,506.62	115,602.15
Crescent P. L.	155,276.15	174,735.31
N. Y. Transit	1,026,626.44	780,549.62
Northern P. L.	123,324.46	121,733.35
Tide Water P. L.	184,082.06	135,162.74
Pure Oil P. L.	164,111.01	142,259.14
Emery P. L.	36,269.19	34,910.38
Paragon Ref.	140,366.56	137,438.90
Indian Ref.	478,240.83	499,369.69
Swiss P. L.	.....	92.36
Pittsburgh P. L.	13,408.70	13,896.04
Paragon Dev.	.....	51,044.86
Total	5,368,680.90	5,303,073.57
Daily average	172,860.67	171,066.89

Gross Stocks

	Dec., '22	Jan., '23
Nat. Transit	1,121,716.17	1,162,899.29
S. W. Pa. P. L.	824,725.35	802,515.99
Eureka P. L.	2,036,301.48	1,852,397.41
Buckeye P. L. (Macksburg)	636,926.48	640,823.52
Buckeye P. L. (Cleveland)	24,403.33	29,276.22
Buckeye P. L. (Lima, etc.)	3,890,631.97	3,402,957.89
Indiana P. L.	617,105.08	650,977.54
Cumberland P. L.	585,982.93	581,147.19
Southern P. L.	890,904.53	972,256.39
Crescent P. L.	99,045.01	78,473.80
N. Y. Transit	1,923,608.02	2,232,629.77
Northern P. L.	976,979.05	818,761.30
Pure Oil P. L.	327,646.70	359,408.61
Emery P. L.	5,776.59	5,972.77
Paragon Ref.	189,650.90	202,067.82
Indian Ref.	164,946.14	221,393.06
Swiss P. L. Co.	.....	6,178.33
Pittsburgh P. L.	7,511.81	.....
Riggs Ref.	.....	2,000.00
Paragon Dev.	.....	18,384.65
Total	14,323,764.96	14,040,566.56
Decrease	849,297.36	283,198.40

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1920	1921	1922	1923
January	56,004	64,466	67,702	75,790
February	68,699	70,054	75,096	.....
March	67,745	68,555	78,531	.....
April	64,589	65,036	75,462	.....
May	63,937	65,466	77,592	.....
June	68,750	62,438	76,193	.....
July	66,489	59,466	76,435	.....
August	63,561	64,888	79,387	.....
Sept.	68,102	60,110	78,512	.....
October	65,066	57,688	77,209	.....
Nov.	62,758	58,470	75,313	.....
Dec.	60,975	61,000	73,351	.....

Daily Average Shipments

	1920	1921	1922	1923
January	98,835	115,550	119,792	171,067
February	107,146	96,736	111,362	.....
March	110,777	84,168	127,753	.....
April	114,090	101,915	127,068	.....
May	110,219	100,353	127,840	.....
June	102,598	105,037	137,638	.....
July	112,340	97,096	137,872	.....
August	122,296	101,652	153,376	.....
Sept.	127,131	117,440	158,761	.....
October	122,981	105,728	165,345	.....
Nov.	117,730	121,803	165,677	.....
Dec.	117,201	104,023	172,861	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines, at the close of each month for the past three years:

	1921	1922	1923
January	7,916,353	16,297,858	14,040,567
February	8,721,873	17,009,293	.....
March	9,818,766	16,877,937	.....
April	10,369,941	16,777,842	.....
May	11,224,694	16,948,962	.....
June	12,328,126	16,810,169	.....
July	13,798,698	16,669,286	.....
August	15,155,633	16,235,229	.....
Sept.	15,526,759	16,228,545	.....
October	15,761,979	15,757,746	.....
Nov.	14,971,971	15,171,972	.....
Dec.	15,854,741	14,323,765	.....

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of December and January, showing the gross stocks of the above fields:

	Dec.,'22	Jan.,'23
Pennsylvania	3,636,411.88	3,669,932.19
Lima	740,681.67	752,496.42
Kentucky	1,924,953.95	2,034,505.98
Mid-Continent	7,909,131.13	7,443,296.93
Illinois	112,586.34	149,335.04
Totals	14,323,764.96	14,040,566.56

Franklin Pipe Line Co.

The following table exhibits the condition of the Franklin Pipe Line at the close of business for the months named and not counted in the stocks and averages reported above:

1922—	Receipts	Shipm'ts	Stocks
January	2,389.52	23.62	17,997.36
February	2,873.48	700.17	20,170.67
March	3,101.87	2,262.24	21,010.30
April	3,494.48	2,037.62	21,467.16
May	3,100.68	2,412.95	22,154.89
June	3,554.83	759.81	24,949.91
July	3,044.26	2,638.75	25,355.42
August	3,190.47	1,196.98	27,348.91
September	3,382.56	3.31	30,728.16
October	3,368.58	4,783.61	29,312.13
November	3,052.75	2,230.18	30,135.70
December	3,076.36	1,292.84	31,919.22
1923—			
January	2,798.55	2,461.36	32,256.41

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

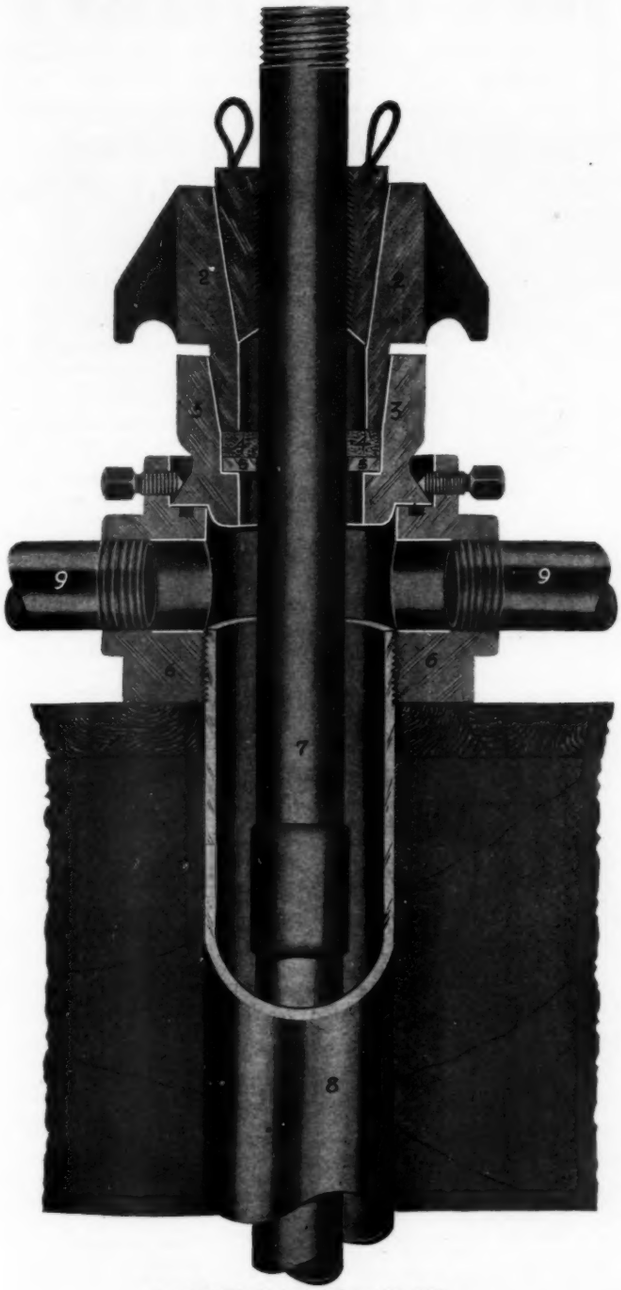
Gross stocks, Feb. 1	2,330,698.49
Runs from wells	567,367.95
Other receipts	280,940.47
Regular deliveries	388,672.40
Other deliveries	501,236.74

The amount of Illinois oil run by the Tide Water Pipe Line Co. in January was 31,871.91 bbls., and deliveries were 32,286.44 bbls. Adding these figures to those of the Illinois Pipe Line Co., makes the runs an ddeliveries from the Illinois field as follows:

1922—	Runs	Deliveries
January	574,553.30	254,256.46
February	524,851.42	204,800.70
March	656,056.93	203,163.01
April	619,792.89	195,739.14
May	655,541.93	347,445.43
June	625,448.20	441,541.49
July	620,979.29	252,294.98
August	648,827.26	370,461.56
September	596,603.99	407,333.79
October	618,459.82	454,005.38
November	566,508.03	434,681.97
December	552,069.33	391,868.37
1923—		
January	599,239.86	470,953.84

The Tide Water Pipe Co. (Ltd.) also delivered in December 123,969.13 bbls. of Oklahoma oil, and 15,500 bbls. of Texas oil. The total deliveries of all grades by the Tide Water were 356,918.31 bbls.

Mildren Tubing Support



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GASO PUMPS for oil field uses

Summary of Statements Made February 10, 1923, Relating to Business of Various Pipe Lines for Month Ending January 31, 1923

	Gross Stocks	Runs from Wells	Other Receipts	Regular Deliveries	Other Deliveries
National Transit	1,162,899.29	218,403.02	1,006,028.56	578,742.72	602,774.71
S. W. Pa. P. L.	802,515.99	93,073.39	957,935.92	262,253.74	808,737.69
Eureka P. L.	1,852,397.41	379,127.65	849,438.01	128,984.51	1,291,962.19
Buckeye P. L. Co. (Macksburg)	640,828.52	281,754.23	457.50	66,047.69	211,034.13
Buckeye P. L. Co. (Lima, etc.)	3,402,057.89	124,560.81	1,971,436.60	765,831.15	1,819,394.71
Buckeye P. L. Co. (Cleveland)	29,276.22	22,074.09	.....	1,257.11	16,163.54
Indiana P. L.	650,977.54	17,402.88	2,195,017.91	1,166,503.80	1,007,362.20
Cumberland P. L.	581,147.19	391,358.03	209.39	126,656.31	278,620.75
Southern P. L.	972,256.39	.....	720,668.67	115,603.15	521,579.82
Crescent P. L.	78,473.80	.....	153,742.23	174,736.31	.....
N. Y. Transit	2,232,629.77	15,823.89	1,076,393.20	780,549.62	.....
Northern P. L.	818,701.30	.....	1,325,836.31	121,733.35	1,358,466.05
Total Jan. 31	13,224,161.31	1,543,577.99	10,257,164.40	4,287,898.46	7,916,095.78
Total Dec. 31	13,628,332.82	1,482,474.44	11,386,714.42	4,381,204.85	9,294,417.60
Difference	404,171.51	61,103.55	1,129,550.02	93,306.39	1,378,321.82

EASTERN MARKET IS SHORT IN ITS SUPPLY OF GASOLINE

By N. O. Fanning

New York, Feb. 24.—The outstanding event in the eastern refined oil market during the week was an advance of 1 cent per gallon in the gasoline tank wagon market covering New Jersey, Delaware, Maryland, District of Columbia, Virginia and West Virginia, and two advances aggregating 2½ cents in North and South Carolina, all made effective by the Standard Oil Co. of New Jersey.

The company also followed this action by advancing all grades of gasoline for export 1 cent per gallon.

The New Jersey gasoline market is now 23½ cents per gallon, tank wagon basis, which is 1 cent higher than the New York market. This is the first occasion in recent years that this condition has existed.

While the upward movement in gasoline is a natural sequence of advancing crude oil prices, it also reflects a shortage of the product, at least in the eastern territory. Refiners along the Atlantic Coast are not in a much stronger position as regards gasoline supplies than they were a year ago, while the position of refiners in every other part of the country is from 25 per cent to 50 per cent stronger. The almost frantic efforts of eastern refiners to secure high grade crude in recent months reflects this condition. Under such conditions, Wyoming crude is more than a luxury in the East. It is an absolute necessity, the way present production is going in the high grade oil fields.

The raising of money by the Sinclair-Standard of Indiana, interests to rush work on the pipe line from Kansas City to Wyoming, is believed to be partly prompted by the gasoline situation at present.

Atlantic Coast refiners only had 14,000,000 more gallons of gasoline on hand at the beginning of 1923 than a year before. Stocks in the Rocky Mountain region were increased in the same period by 54,000,000 gallons, or more than 100 per cent. This gasoline is not in demand locally, so it must naturally find an outlet, probably in the East. Refiners in the Gulf Coast and Mid-Continent region are glutted with gasoline, and they do not need the reinforcement from Wyoming. This statement should be qualified, inasmuch as the stocks are understood to be largely in the hands of the larger companies. A heavy movement of gasoline from the West to Atlantic Coast points by tank car can be expected over the next few months.

Lubricants Firm

The lubricating oil market shows a degree of firmness which gives encouragement to refiners. The demand seems to be holding up unusually well, especially for export. Prices are unchanged, but the trade looks for early advances.

The eastern kerosene market is weak. Interest has practically died out in regard to this product, the only demand for which comes from foreign sources, apparently. This dullness is, of course, largely seasonal, as the kerosene market finds itself between the heating and tractor seasons.

Heavy Wax Exports

Marketers report heavy exports of wax during the last few weeks. Stocks of wax in the East are low, as Atlantic Coast refiners have had the work of supplying the greater part of the export demand.

Mexican Imports Low

Imports of Mexican crude and fuel oil during the week ended February 23, totaled 182,000 bbls., of which Mexican Petroleum Co. imported 140,000 bbls., and the Standard Oil Co. of New York, 42,000. During the preceding week imports amounted to 196,000 bbls., and the week before that 207,000 bbls.

The following table shows imports of crude and fuel oil at the port of New York by companies during the week of February 23, compared with the preceding week, (in barrels):

	Week Ended Feb. 23	Feb. 16
Mexican Petroleum	140,000	66,000
Standard of N. Y.	42,000	.....
Standard of N. J.	.....	65,000
The Texas Co.	.....	65,000
Total	182,000	196,000
Daily average	26,000	28,000

The price of Mexican crude oil remains steady at $1.35 and $1, respectively, for Tuxpam and Panuco crudes at Mexican ports. The cost of this crude at New York is $1.87 for Tuxpam and $1.43 for Panuco.

An interesting comparison between the cost of Panuco crude and California crude of 14 gravity is had from the above figure. California crude is 60 cents per barrel at the well, and the delivery cost to New York is about 80 cents, or a total of $1.40. Panuco crude, delivered at New York, is $1.43, and the gravity of the oil is about the same.

WILL DISCUSS GEOLOGY OF SEVERAL SOUTHERN STATES

Shreveport, La., Feb. 24.—At the meeting of the American Association of Petroleum Geologists to be held here in March, one of the main regions to be discussed will be the Gulf Coast country; also Mexico and the area occupied by the States of Georgia, Alabama, Mississippi, Arkansas, Louisiana and Texas. Through discussion of these papers some valuable information will, no doubt, be brought to light and all those who attend will be well rewarded for their coming. Announcement of the full program will be made as soon as it is compiled, showing the papers to be given together with the names of the authors.

That there will be a full attendance at the convention is evidenced by the applications for hotel space and notification to the reception committee at Shreveport by members of the organization.

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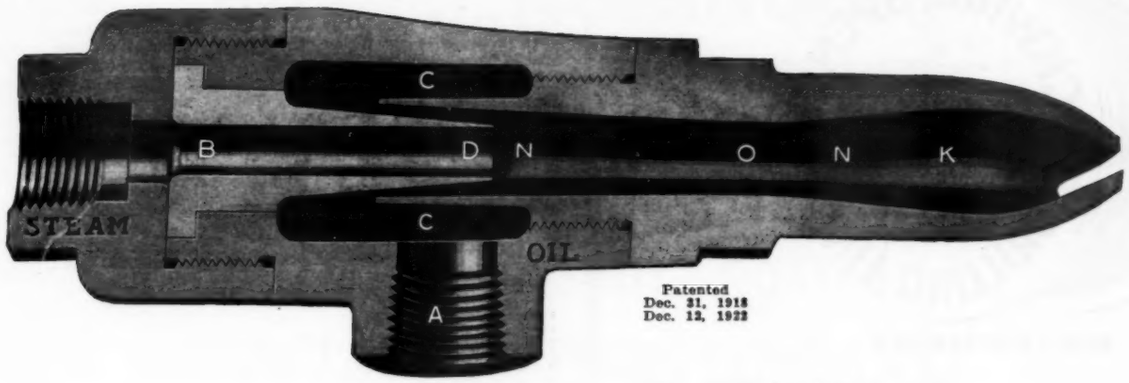

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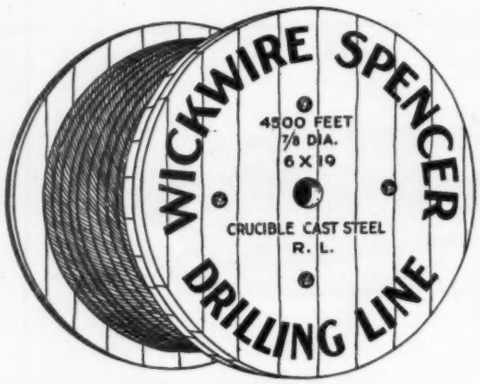

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Stocks of Oil Well Lines Are Carried at These Points

MEXICAN PRODUCTION IN 1922 BY MONTHS, FIELD AND COMPANIES

By N. O. Fanning

New York, Feb. 24.—The production of crude oil in Mexico during 1922 amounted to 185,057,249 bbls., compared with 194,755,712 bbls. the preceding year, according to figures of the Department of Industry, Commerce and Labor of Mexico City, just made public for the first time in the United States. The southern fields, or Tuxpam zone, yielded 138,280,924 bbls. in 1922, while the Panuco and other heavy oil fields produced 46,763,959 bbls. Only 12,366 bbls. were produced in the region of the Isthmus of Tehuantepec.

The largest production ever recorded in Mexico for a single month was registered in December, 1921, when 23,931,740 bbls. were produced. Just how Mexico's production has risen and then dropped off during the last three years is shown by the following table of production of barrels by months in 1920, 1921, 1922:

	1920	1921	1922
January ..	8,160,143	16,240,622	21,034,728
February .	7,630,028	15,063,885	17,665,848
March	9,934,212	17,841,887	18,518,288
April	9,739,719	18,614,790	16,193,382
May	12,374,311	16,863,282	16,775,690
June	12,733,451	16,976,597	17,105,856
July	14,321,242	11,397,266	14,974,923
August ...	14,909,854	8,987,070	12,750,672
September.	15,568,750	12,740,836	11,430,760
October ..	17,437,660	14,984,309	12,584,353
November.	15,920,764	21,113,448	12,589,447
December..	17,808,877	23,931,740	13,033,301
Total Yr.	156,539,011	194,755,712	185,057,249

Official statistics published six months ago exclusively by The Oil and Gas Journal showed a total production in Mexico of 106,120,595 bbls. for the first half of 1922. The output for the last six months thus amounted to only 78,936,654 bbls., a decline of approximately 20 per cent, compared with the preceding half year.

Production by companies for the first and last half of 1922, and for the whole year, in barrels, is shown in the following table:

	1922		
	First Half	Last Half	Total
Mexican Petroleum	33,121,303	24,317,122	57,438,425
Dutch-Shell:			
La Corona Petroleum	8,116,345	9,541,899	17,658,244
Mexican Eagle Oil	4,479,926	9,360,471	13,840,397
Mexican Gulf Oil	19,771,653	8,468,579	28,240,232
Mexican Seaboard Oil	15,307,903	4,616,050	19,923,953
Standard of New Jersey	2,185,335	3,206,806	5,392,141
Atlantic Gulf Oil	2,867,246	1,846,241	4,713,487
Magnolia Petroleum	2,088,099	2,593,454	4,681,553
The Texas Co.	1,897,838	2,102,143	3,999,981
Penn. Mex. Fuel Co.	1,966,940	919,132	2,886,072
Sinclair Consolidated	1,307,955	1,569,073	2,877,028
Island Oil	1,560,857	421,009	1,981,866
Southern Pacific	1,034,139	884,512	1,918,651
Atlantic Lobos Oil	435,710	255,335	691,045
Miscellaneous	9,979,346	8,834,828	18,814,174
Total	106,120,595	78,936,654	185,057,249

Production of the Mexican Petroleum Co., Mexican Gulf Oil and Mexican Seaboard Oil during the last half of 1922 showed a marked falling off compared with the figures for the first half. This is largely due to the appearance of salt water in the Toteco oil field and necessary loss of output resulting from closing in of the wells. The Toteco field was shared by the three companies named.

As shown in the table, the Dutch-Shell interests largely increased their output during the last half of 1922, as compared with the first half. Mexican Eagle Oil, in fact, doubled its output, yet its total production for the year of 13,840,397 bbls. was small compared with that of the year 1921, when it totaled 32,434,864 bbls. The Standard Oil Co. of New Jersey, Magnolia Petroleum, The Texas Co., and Sinclair Consolidated also increased their crude oil output in Mexico during the last half of the year.

Production by companies for the four years 1919-1922, inclusive, is shown in the following table, with percentages (quantity in barrels):

	1922	1921	1920	1919
Mexican Petroleum	57,438,425	29,464,706	12,545,578	16,948,139
Dutch-Shell:				
La Corona Oil	17,658,244	12,833,192	4,267,375	825,603
Mexican Eagle Oil	13,840,397	32,434,864	32,381,555	18,866,174
Mexican Gulf Oil	28,240,232	19,057,763	11,944,056	5,955,597
Mexican Seaboard Oil	19,923,953	12,438,859	7,964,341	276,974
Standard of N. J.	5,392,141	13,769,363	19,240,073	7,177,828
Atlantic Gulf Oil	4,713,487	8,673,621	6,713,632	.....
Magnolia Petroleum	4,681,553	9,512,337	2,977,963	384,762
The Texas Co.	3,999,981	6,416,964	12,525,158	5,173,989
Penn. Mex. Fuel Co.	2,886,072	5,184,589	7,233,695	8,667,566
Sinclair Consolidated	2,877,028	10,460,012	11,127,545	4,986,704
Island Oil	1,981,866	4,283,906	3,642,061	5,152,156
Southern Pacific	1,918,651	2,131,304	3,020,508	4,348,542
Atlantic Lobos Oil	691,045	3,613,344	361,757	4,257,028
Miscellaneous	18,814,174	24,540,888	20,117,410	3,341,569
Total	185,057,249	194,755,712	156,062,707	87,359,532
Number producing companies	89	50	35	28
Percentages by Companies				
Mexican Petroleum	31	15	8	19
Dutch-Shell:				
Corona	9	6	2	..
Mexican Eagle Oil	7	16	20	21
Mexican Gulf Oil	14	10	8	7
Mexican Seaboard	10	6	5	..
Standard Oil of N. J.	2.7	7	12	.8
Total Pec Cent of Mexico's Output	73.7	60	55	47.8
Remainder	26.3	40	45	52.2
Total	100.0	100	100	100.0

Of further interest in showing the marked falling off in crude output in the light Mexican oil fields during 1922 are the official statistics showing output by zones by months during the year in barrels:

	Tuxpam Light Oil Fields	Tampico Heavy Oil Fields
January	4,159,514	16,873,654
February	3,343,336	14,321,833
March	4,426,756	14,671,035
April	3,740,059	12,462,923
May	3,681,770	13,092,817
June	3,171,626	13,933,551
July	3,492,648	11,481,772
August	3,877,816	8,872,542
September	3,219,775	8,208,016
October	4,388,379	8,845,609
November	4,678,942	7,909,455
December	4,913,348	8,117,817
Total	46,763,959	138,280,924

The following table shows exports of crude and refined oils from Mexico by companies, together with the export taxes paid by each, during 1922, (quantity in barrels):

	Exports	Taxes Paid
Mexican Petroleum	39,571,692	$ 7,639,360
Dutch-Shell:		
La Corona Oil Co.	20,294,348	2,655,461
Mexican Eagle Oil	16,043,794	2,509,422
Gulf Oil (Mexican Gulf)	19,822,906	3,373,836
Standard Oil of N. J.	19,115,775	3,079,219
Mexican Seaboard Oil	13,781,546	2,462,762
The Texas Co.	9,809,408	1,539,075
Atlantic Gulf Oil	7,259,639	1,330,211
Sinclair Consolidated	6,582,253	705,385
Miscellaneous	28,868,417	3,892,247
Total	181,149,778	$29,187,078

Comparing figures of production with those of exports by companies it will be found that many concerns exported a much larger quantity than they produced during 1922. The surplus oil came from storage. In the case of the Mexican Petroleum Co., a large quantity, it is believed went to supply Mexican consumption, as the company's production exceeded exports by approximately 18,000,000 bbls.

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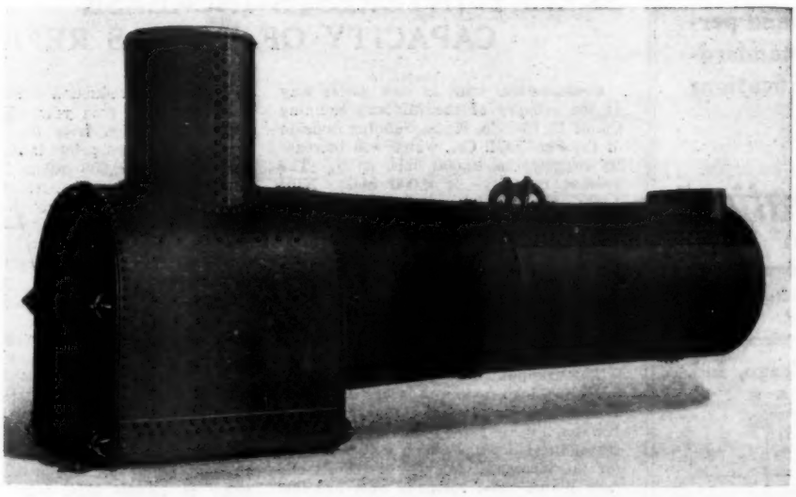

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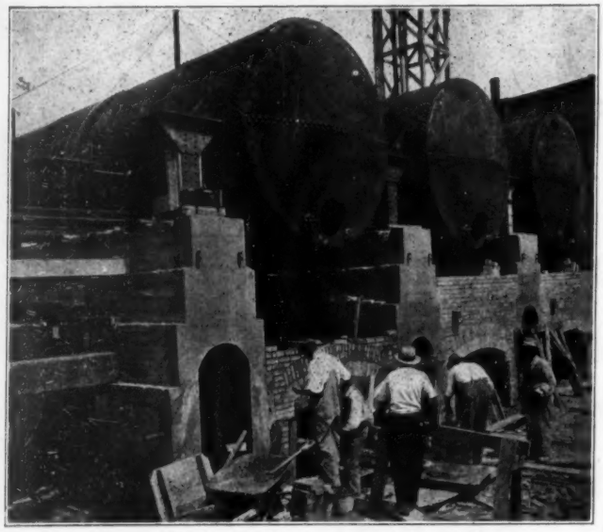

The Name **GRAVER**

IF the name "GRAVER" were visible on all the equipment in the petroleum industry that GRAVER Corporation has built, it would be seen wherever petroleum, crude or refined, is handled. Some of it would date back to the earliest days of the industry.

For sixty-five years GRAVER Corporation has grown with the industry, building tank farms in the fields, steel plate construction in refineries, and tanks for bulk stations and filling stations.

Large stocks of material always on hand permit prompt shipment of GRAVER Standardized Tanks. Bulletins, prices and specifications on request.

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Bulletins on the following subjects will also be mailed on request:

Bulletin No.		Bulletin No.	
Graver Hot Process Water Softener	J-504	Graver Water Softener for Raw-Water Ice Plants	J-508
Graver Type "K" Water Softener (Large Continuous Cold Process	J-506	Graver Combined Hot Water Heater and Storage Tank	J-511
Graver Small Continuous Cold Water Softener	J-507	Water Supply for Swimming Pools	J-500
		Graver Storage and Welded Tanks	J-3

STANDARD WITNESSES DECLARE BLACK'S TESTIMONY WAS UNTRUE

WASHINGTON, D. C., Feb. 26.—To refute the charges made against that company by Thomas S. Black, president of the Western Petroleum Co. of Chicago, the Standard Oil Co. presented four witnesses at a special hearing before the subcommittee of the Senate Manufactures Committee here today.

Dr. William M. Burton, president, and R. W. Stewart, chairman of the board of the Standard Oil Co. of Indiana; John M. Carson, president of the Taxman Refining Co. of Chicago, and E. S. Hughes, former vice president of the Western Petroleum Co., all categorically denied and declared false portions of the testimony given by Black before the committee two weeks ago to the effect that the Standard Oil Co. of Indiana had fixed prices. W. H. Isom, by telegraph, presented further denial of Black's charges.

The various witnesses, appearing at a reopening of the committee investigation, one after the other, challenged the truthfulness of Black's testimony in detail.

Doctor Burton branded as "absolutely untrue" testimony by Black that he, as president of the Standard Oil Co. of Indiana, promised to give the Western Petroleum Co. considerable business as oil brokers if Black would take care of his stepson, Mr. Hughes. He further denied that the Standard Oil Co. of Indiana gave Black advance information as to changes in the price of crude oil and gasoline.

Similar attacks on Black's testimony were made by Mr. Stewart, who declared that if Black had had any conferences with the Standard Oil Co. of Indiana officials relative to fixing of prices, such dealings were without the knowledge, consent or approval of the Standard Oil Co. of Indiana.

More Salaries Announced

Salaries paid officials of nine large oil companies were disclosed by the committee, but none were in excess of $100,000. R. W. Stewart, chairman of the board of directors, and W. M. Burton, president and director of the Standard Oil Co. of Indiana, according to the report made public today, receive, $100,000 a year each. The highest officials of the other eight companies were listed as receiving annual salaries as follows:

J. C. Donnell, president, director and general manager of the Ohio Oil Co., $50,000; W. F. Gates, president, general manager and director of the Prairie Pipe Line Co., $20,000; A. P. Coumb, president and director of the Standard Oil Co. of Ohio, $23,000; J. W. van Dyke, president of the Atlantic Refining Co., $66,666; H. F. Sinclair, chairman of the board of Sinclair Consolidated Oil Corporation, $75,000; E. C. Lufkin, chairman of the board, and Amos L. Beaty, president of The Texas Co., $50,000 each; W. L. Stewart, president, and E. W. Clarke, executive vice president of the Union Oil Co. of California, $41,250 each, and J. C. van Ech, president and director of the Shell Co. of California, $30,000.

COMPLAINS AGAINST STANDARD OIL (LA.)

NEW ORLEANS, La., Feb. 26.—Huey P. Long, chairman of the Louisiana Public Service Commission, wrote United States Senator Robert M. La Follette on Saturday from Shreveport charging that the Standard Oil Co. of Louisiana dominated the local gasoline situation at New Orleans. Long's letter said the jobbers' margins were reduced from 6½ cents last August to a total margin of 3½ cents between service stations and the jobbers' price today.

Mr. Long's letter declared the Standard Oil Co. in manipulating prices is going to put the jobber out of business. He charged that the company froze out refiners from service stations and even in oil fields. Mr. Long said that he had attempted to secure aid from the Federal Government to prevent the freezing out of independent competition, but that the Standard Oil Co. was so entrenched at Washington that "we should look for nothing from the Federal Government when it came to regulating the Standard Oil. Co." W.H.R.

SKELLY INTERESTS INCREASE CAPACITY OF KANSAS REFINERY

Construction work is now under way at the refinery of the Midland Refining Co. of El Dorado, Kans., refining division of the Skelly Oil Co., which will increase its capacity to 10,000 bbls. daily. The present capacity is 6,000 bbls. Nine 1,000 bbl. stills are being installed, and it is expected that all construction work will be completed and the plant in operation with the increased capacity by June 1. In addition to the stills, other equipment is being added to care for the increased capacity. This includes considerable additional crude and refined storage.

The company has just completed 35 miles of 6-inch main and lateral lines into Butler and Greenwood County fields of Kansas. These lines were laid to provide the additional crude which will be needed for the increased capacity of the El Dorado plant. The company now has 200 miles of 4 and 6-inch main and lateral lines in Greenwood and Butler Counties. The enlargements at the refinery and added pipe line facilities will cost approximately $450,000, according to officials of the company.

The increased output of the Kansas plant will give the Skelly interests a refining capacity of 12,000 bbls. daily by early summer. A 2,000-bbl. plant, known as the Nortex Refining Co., at Burkburnett, Texas, is owned and operated by the company. The output of both plants is marketed by the Midland Refining Co.

The Skelly Co. has also made rapid strides in the production of natural gasoline during the past year. The present actual production from five plants, located at scattered points in the Mid-Continent area is 50,000 gallons daily. Two additional plants are under construction, which will bring the daily output to approximately 75,000 gallons daily by midsummer. This represents a large surplus over the needs of the company for blending at its own plants.

The retail marketing facilities of the company are being enlarged. The company now has retail distribution in 73 towns of the Northwest and additional filling stations are to be added. The refineries are backed with a crude storage of 2,000,000 bbls. in the Mid-Continent area at the present time. This oil is of 38-degree to 39-degree gravity. The present crude production of the company is 18,000 bbls. daily net. The Skelly Co. during the past week, purchased a half interest in the Unity Building of Tulsa, giving the concern full ownership, as it has owned and occupied a half of the building for some time. The building was purchased to provide additional office facilities.

DEATH OF W. A. EARSEMAN

PITTSBURGH, Pa., Feb. 27.—William A. Earseman, a pioneer and retired oil man, died here yesterday at the home of his son, Dr. J. S. Earseman. He was aged 82 years.

A CORDIAL INVITATION

To the Oil Marketers of America:

The St. Louis Petroleum Club of the St. Louis Petroleum Oil Dealers, extends a most cordial invitation to all oil marketers to attend the ninth annual meeting of the National Petroleum Marketers Association, to be held at the Chase Hotel, St. Louis, Mo., March 6, 7 and 8.

We here in St. Louis have not left a stone unturned to make this the largest and most successful meeting the Association has ever held, and solicit your attendance, feeling that if you fail to attend the loss will be yours.

Therefore, the oil men of St. Louis extend to you a most cordial invitation to come and enjoy their hospitality.

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Accurately manufactured of Rust Resisting Keystone Copper Steel, the Maloney is adaptable to all weather and climates. It gives the maximum service at the minimum cost. It meets all the requirements of tight deck construction to conserve evaporation. They are durable and dependable.

Eight 1,000-bbl. Maloney Tanks in foreground and nine in the background in the Mexia (Tex.) Field

Decks have tight manhole with packed joints—also flanges for gauging and inlet purposes—the same construction throughout the deck as balance of tank. Cleaning-out plate in the side flush with bottom—easily removed—tank cleaned —plate replaced without getting inside of tank—one-man job and no risk from gases. Specify Maloney Rust-Resisting Copper Steel Tanks.

Made of KEYSTONE COPPER STEEL

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Modernly equipped Export Department gives prompt and dependable service. Tanks knocked down, securely packed in steel pound crates, easily handled at port.

Natural Gas Developments

CANADIAN GAS CO. IS VICTOR IN RATE CASE

CHATHAM, Ont., Feb. 26.—The appellate division of the Supreme Court of Alberta has allowed the appeal of the Canadian Western Natural Gas Co. and reversed the decision of Justice Tweedie, the trial judge, in the case of the city of Lethbridge against the company. Last spring, following the refusal of the city to agree to an increase in gas rates, the company notified the city that the gas supply would be cut off. The city applied for and secured an injunction, on the ground that its franchise, fixing a 35-cent rate, did not expire until July 30, 1927. The trial judge, Justice Tweedie, sustained the city's contention, holding the franchise and the 35-cent rate good until 1927, and continuing the injunction. The company appealed against this decision and the judgment of the trial court finds in favor of the company, and dissolves the injunction, though a stay of judgment for 30 days is granted to allow the city to make an application to the Alberta Public Utilities Commission to fix a rate. Justice Stuart dissented from the appeal decision, and agreed with the trial judge. The city may further appeal the case to the Supreme Court of Canada or the Privy Council.

In Ontario, the Natural Gas Board of Reference has granted rehearings in the rate cases of Port Burwell, Southwold, Dunwich, Aldborough, Dutton, West Lorne and Rodney. In the Southwold, Dunwich and Aldborough cases, the Southern Ontario Gas Co. is appealing the previous decision that these places hold transmission franchises and are entitled to original franchise rates, while the municipalities are appealing in the other cases against rate increases recently granted.

Colonel R. B. Harkness, Natural Gas Commissioner for Ontario, has ruled in the case of the town of Bridgeburg that under existing legislation, no natural gas company can take on additional customers. The Provincial Natural Gas Co. refused connections to new consumers even where the extensions were laid through private enterprise. The ruling is designed to conserve the supply for present domestic patrons.

The Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary, reports earnings for December, 1922, of $125,990, compared with $102,218 for December, 1921, an increase of $23,772. For the last three months of the year, earnings totaled $281,338 compared with $261,274 for the corresponding period of 1921.

U. S. SUPREME COURT SETS APRIL 16 FOR STEPTOE ARGUMENT

WASHINGTON, D. C., Feb. 27.—The United States Supreme Court today set April 16 as the date for the reargument of the original suits brought by the States of Pennsylvania and Ohio against the State of West Virginia, to prevent the latter State from enforcing the Steptoe Act, a bill which prohibits the exportation of natural gas from West Virginia until all requirements of consumers in that State have been supplied. These suits were inaugurated several years ago and an injunction issued preventing the enforcement of the law until the Supreme Court could decide upon its constitutionality. Hearings before a master appointed by the court were held in Pittsburgh, Columbus, Ohio, and Charleston, W. Va., and voluminous testimony developed. The case has been reargued before.

Ohio and Pennsylvania are largely dependent upon natural gas produced in West Virginia for their supplies. The large natural gas companies located in the former two States were organized, primarily for the purpose of developing this gas in West Virginia and transporting it to the large consuming centers of southwestern Pennsylvania and Ohio. It is claimed by Pennsylvania and Ohio if the Steptoe Act is enforced, it will cause serious suffering among hundreds of thousands of consumers of the two States, as houses in sections of these States where natural gas is used now as a fuel are not constructed so that any other fuel, except manufactured gas, might be used, not having proper flues. It is claimed it would cost each home-owner on an average of $200 to change his home so that other fuel might be used.

It is also contended if the Steptoe Act be enforced, it would result in numerous factories, mills and carbon black plants locating in West Virginia, where the law would insure them an adequate supply of cheap natural gas, and that these industries would then consume the natural gas now being used by domestic consumers in Pennsylvania and Ohio.

In 1921, Ohio produced 47,412,000,000 cubic feet of gas and transported 3,156,000,000 cubic feet of this to Indiana and West Virginia from wells located along the borders of these States. Ohio consumed 106,051,000,000 cubic feet of gas in 1921, getting 61,731,000,000 cubic feet, or almost two-thirds from West Virginia. Pennsylvania consumed 100,615,000,000 cubic feet in 1921 and procured 25,193,000,000 cubic feet of this amount from West Virginia. Hence, the dependability of Ohio and Pennsylvania on the gas imported from West Virginia is easily seen.

Former Attorney General George E. Alter of Pennsylvania and A. L. Weil, an attorney of Pittsburgh, will argue the case for Pennsylvania before the Supreme Court. Freeman T. Eagleson acted as counsel for Ohio in the hearings conducted. The original injunction against West Virginia was obtained by Attorney General John G. Price of Ohio, in May, 1919.

GAS OFFICIALS PROMOTED

Bert C. Oliphant, formerly president of the Iroquois Gas Corporation, has been promoted to the presidencies of the Pennsylvania Gas Co. and the Pennsylvania Oil Co. He will make his home in Warren, Pa. Thomas R. Weymouth, for the past 12 years chief engineer of the United Natural Gas Co., with headquarters at Oil City, Pa., has been elected president of the Iroquios Gas Corporation to succeed Mr. Oliphant.

ORGANIZE LUBRITE SALES CORPORATION

The Lubrite Refining Co. and Tulsa Oil Products Co. have organized the Lubrite Sales Corporation, which will handle the tank cars sales departments of both companies. General offices will be maintained in St. Louis, with branches in Tulsa and Omaha.

The new company will direct and handle retail distribution of Lubrite gasoline and motor oils. The Lubrite Refining Co. recently announced an expansion program, involving an expenditure of approximately $500,000, which includes the installation of four Fleming cracking units. It will run 2,000 barrels of crude daily through its plant, located in St. Louis.

The Tulsa Oil Products Co. is one of the largest independent distributors of petroleum products in Tulsa. It operates tank wagons and filling stations, and in addition a tank car marketing division is conducted.

Much Needed Organization

There should be an organization of oil men representative of every branch of the petroleum industry. Such an organization is necessary at this time to properly protect the interests of oil men and to foster harmony and better industrial relations. Militant outsiders, whose object it is to benefit financially by making the industry furnish the money in the form of taxes, must be dealt with drastically.

In nearly every state in the Union ambitious legislators have introduced bills aimed at getting money out of production, refining and marketing of petroleum and its products by means of tax laws. Concerted action is needed immediately.

The many problems vital to your business will be intelligently discussed at the

Congress Hotel, Chicago

March 6, 7 and 8

Come and Talk Things Over

The oil industry has been given too much misleading advertising of late. The newspapers exploit stories of enormous profits and minimize the huge investments and the great losses. This must be corrected.

We must have publicity of a comprehensive character that will enable the general public to consider the petroleum industry intelligently and fairly.

Every oil man should take an active interest in the affairs of the business—his business. With this in view, we invite you to come to Chicago March 6, 7, and 8 and talk things over.

"In the interest of all, opposed to none."

American Oil Men's Association

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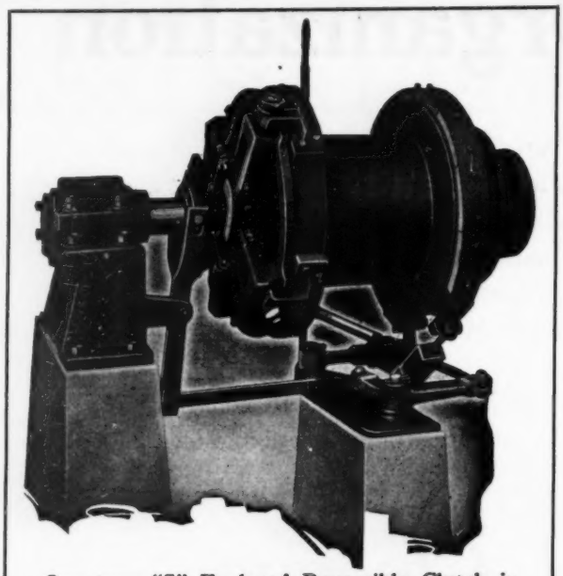

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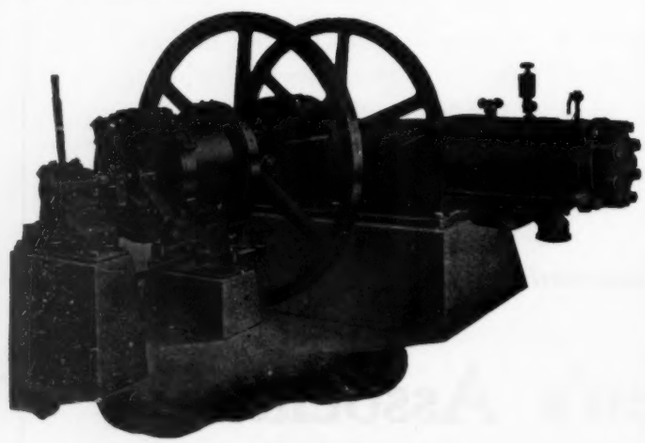
The only Oil Field Engine manufactured successfully employing the simple, certain and highly satisfactory VALVELESS feature.

Eliminates broken springs, frequent adjustments and grinding of valves—can be easily and quickly started by one man in any kind of weather.



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DRILLING METHODS IN TONKAWA FIELD

J. S. Ross, in Report to the Bureau of Mines on Petroleum Engineering in the Tonkawa Oil Fields, Shows the Advantages and Disadvantages of Both Cable and Rotary Systems in That Territory.

By J. S. Ross *Bureau of Mines*

In Preliminary Report on Petroleum Engineering in the Tonkawa Field.

The upper formations in the Tonkawa Field consist of Permian "Red Beds." At depths of from 1,000 to 1,100 feet the Pennsylvanian formations are penetrated. The producing oil horizons are generally believed to be in the formations of Pennsylvanian age.

The Permian is the geological name given to the series of red shales, sandstones and limestones that make up the formations overlying the Pennsylvanian rocks and which are the outcropping formations over the general western part of Oklahoma. Because of the predominance of red clays and shales this part of the Permian is more commonly known as the "Red Beds."

The upper 900 feet of the red beds consist principally of red shales. The first marker which can be generally recognized by the driller is the limestone layer at depths of from 300 to 450 feet, believed by some geologists to be Winfield lime. This limestone varies from 10 to 30 feet in thickness. Near the base of the red beds, at depths between 800 and 900 feet, there is a zone of gas and water sands which extends over the entire area. This zone is about 150 feet in thickness and consists of a number of thin sands which are lenticular and very irregular.

Below these gas and water sands there is a shale bed of about 125 feet in thickness. In most of the wells a thin bed of limestone is encountered near the middle of this shale member. A bed of "red rock," which varies in thickness from a few feet to 60 feet, underlies this shale and is believed by geologists to be the base of the Permian, as it overlies the Foraker, a limestone, generally recognized as of Pennsylvanian age.

Pennsylvanian Rocks

A massive limestone of an average thickness of about 110 feet is found at a depth of about 1,000 feet in the north end of the Tonkawa Field and about 1,100 feet in the south end of the field. This limestone is easily recognized by the drillers. G. C. Clark, of the Marland Refining Co., who has made extensive study of the subsurface formations in this district, has correlated this limestone by means of well logs with the Foraker limestone in the Burbank Field. The character and thickness of this limestone, together with the character and sequence of overlying formations, makes it an excellent marker for correlation.

There are about 700 feet of alternating beds of shale, limestone and sandstone underlying the Foraker limestone. Shale predominates in the upper part and limestone in the lower part of this series Persistent beds of sandstone are found at the base of this series from about 1,500 to 1,800 feet.

A limestone ranging from a few feet to 40 feet and of an average thickness of 30 feet lies at depths varying from about 1,750 to 1,900 feet, depending on the location in the field. Clark has correlated this limestone with the Pawhuska limestone which outcrops in Osage County. The top of this limestone lies at a constant interval of about 800 feet below the top of the Foraker limestone. In most of the wells the Pawhuska limestone is separated from overlying limestone by from 25 to 75 feet of blue shale. A thin bed of red shale is often logged directly below it. The Pawhuska limestone, like the Foraker, is persistent over the area and is a good marker.

The Hoover sand zone is made up of a series of irregular but closely related sandstones lying at an average of from 50 to 60 feet below the top of the Pawhuska limestone. This zone averages in thickness from 150 to 250 feet and consists principally of an upper and a lower sand member, both of which produce oil in certain parts of the Tonkawa Field. In many of the wells an intermediate sand, which carries water and in one well produces oil, can be recognized, but this sand is often logged as a lower part of the upper Hoover.

About 500 feet of limestones and shales are found between the Hoover sand zone and the Tonkawa sand. A persistent water sand lies at about 450 feet below the top of the Pawhuska limestone, at depths from about 2,300 to 2,400 feet.

The Tonkawa sand is the deepest producing sand in the field at present and is found at depths from about 2,425 feet in the north end to about 2,630 feet in the south end of the field. Formations lying below the Tonkawa sand were penetrated in two wells.

Drilling Methods

Cable tool equipment was used exclusively during the early development of the Tonkawa Field, but owing to the difficulty in drilling through the gas sands, rotary tools were substituted. At the present writing rotaries have practically replaced cable tools except at wells being drilled near the outer edges of the field. All of the shallow gas sand wells are drilled with portable drilling machines.

The first rotary in the field was used by the Southwestern Petroleum Co. at Murray No. 9, Section 10. Drilling on this well was commenced on March 15, 1922, and approximately 100 days were consumed in drilling to a depth of 2,448 feet. The average time for drilling the same depth now is about 55 to 60 days.

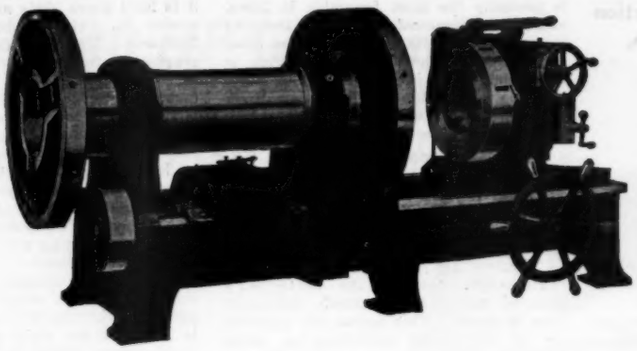
The rotary system has proved more successful than cable tools in certain parts of the field where high pressure gas sands are encountered, because these sands can be mudded off with no loss of time, whereas with cable tools it was frequently necessary to spend from one to several days to mud off these sands.

Among the principal disadvantages of rotary drilling are the poor logs of the formations penetrated and the danger of passing through productive oil sands without knowledge of their existence, especially if the sands are thin. Poor rotary logs are not always the fault of the system, but are often due to the drillers failing to observe and record changes in formation by noting the returns in the ditch and the way the tools are working. Considerably more difficulty was experienced in correlating the upper formations reported in rotary drilled holes than in cable tool holes in the Tonkawa Field. It is the general practice in the Tonkawa Field to take core samples with rotary tools while drilling through the upper productive sands and also while drilling into the Tonkawa sand. Most of the operators use an ordinary saw-tooth core barrel. The average length of core thus secured is from 6 to 20 inches. Longer cores which are desirable could probably be secured with the proper use of a double core barrel.

The greater part of the formations encountered in the Tonkawa Field below the red beds are difficult drilling for the rotary tools. Rock bits of the revolving cone type are used continuously in the harder formations.

The usual practice with rotary tools is to drill to a certain depth above the productive oil sand, about 2,400 feet in the case of the Tonkawa sand, then cement one string of casing. While the cement is setting, usually from 10 days to two

(Continued on page 88)



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Look at the picture. Don't it look like a real, honest-to-goodness pipe machine? Single pulley drive, two powerful gripping chucks that keep the pipe going. Driving mechanism is compact and almost entirely concealed in the bed.

When a B&K pipe machine is installed, you can cut off, ream and thread pipe, and that is what you are looking for.

A Catalog Ready to Start Your Way

BIGNALL & KEELER MACHINE WORKS

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REEVES Vertical 4 Cycle GAS ENGINES, 1 to 4 Cylinders—18 to 225 H. P.

For Natural Gas

Cover the whole range of power requirements for gas and oil pumping stations, booster plants, gasoline extraction plants, and similar uses.

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Up-to-the-Minute in Design

Embodying many important features such as double-ignition, high-tension magnetos, force-feed oiling, valve-in-head design.

Send for catalog, specifications and blue prints, stating size you need.

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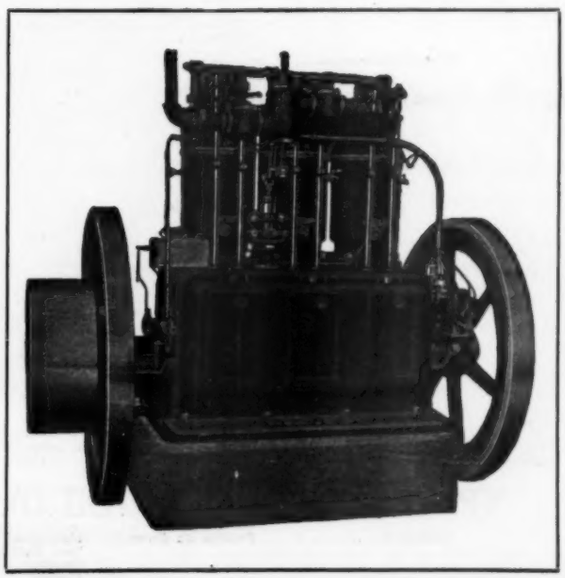

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THE OIL AND GAS PROSPECTS OF IOWA

In Which Dilworth S. Hager, Chief Geologist for the Gulf Production Company, Gives the Results of a Geological Survey, Which, While It Does Not Condemn the Territory, Gives Little in the Way of Promise.

By Dilworth S. Hager
Chief Geologist, Gulf Production Co., Houston, Tex.

To date, Iowa has produced no oil at all and little gas, although numerous wells, deep and shallow, have been drilled throughout the State. These tests have been almost entirely for water, and a few for coal. They would have disclosed oil or gas, however, if these substances were present at the points drilled.

Small pockets of gas have been found in glacial deposits, especially near Letts, in Louisa, County, and Herndon, Guthrie County. The total value of natural gas in Iowa in 1914 was small. It was used for illuminating purposes. This gas probably originated from carbonaceous matter entrapped in loose Pleistocene sands and gravels, and will never be a commercial proposition. If oil or gas is to be found in the State in paying quantities, one must look to the underlying stratified rocks.

Stratigraphy

Glacial drift and associated subaerial deposits cover nearly the entire State, except in the northeastern corner. In most localities they still overlie the older rocks. This mantle averages 100 to 200 feet in thickness, with probably a maximum of 600 feet in Louisa County. Exposures of the older rocks occur mostly along streams.

Beneath the drift in western and northwestern Iowa are rocks of Cretaceous age. In the rest of the State the drift is underlain by Paleozoic sediments. Cambrian rocks outcrop in the extreme northeastern part, in which area the dip of the strata is south and west. So, in traveling from the northeastern corner of the State to the southwest, one encounters successively beds of Ordovician, Silurian, Devonian, Mississippian and Pennsylvanian age. These areas of outcrop follow a roughly northwest and southeast trend.

The following is a generalized geological section of the rocks of Iowa.[2] See table below.

The Cambrian system has nowhere produced oil or gas. In Iowa, it consists largely of sandstones, and the shales present are white to yellow and buff-colored. So one can safely eliminate this part of the section. The Ordovician system offers two possible horizons, the Platteville and the upper part of the Galena limestone in contact with the Maquoketa shales. These will be discussed later. The Silurian system consists mostly of light-colored dolomites, with cherty and arenaceous beds. Logs of wells, west and south of the outcrop, show red gypsiferous marls above this dolomitic phase. Judging by the color and nature of these strata it is unlikely that they will be productive. If sufficient carbonaceous material were present in these rocks to form paying quantities of oil or gas, it would have darkened the color of the sediments, and at least a few dark shales and dolomites would be intercalated. For the same reason, the Devonian rocks are not favorable. They consist for the most part of light-colored dolomites, limestones and shales. In a log of the city well at Pella, Marion County, gypsiferous beds of marl occur. While local beds of coal and coaly shales are found in the Wapsipinicon formation at Independence, Iowa, well logs throughout the State show light-colored sediments. The Mississippian series have been a prolific producer in certain areas outside of Iowa. Here, however, the limestones are hard, and sand is noticeable by its absence. Above this horizon is the Pennsylvanian series. This is probably the most favorable in Iowa, and will be discussed later. The Permian is very thin and its gypsum and red color condemn it. The Cretaceous series is thin, and while indicated on the State map as a continuous formation, over much of the area, these rocks occur in more or less isolated patches.

Regional Structure

The stratified rocks of Paleozoic age in Iowa have, with local exceptions, a south component in their dips. In eastern Iowa, dip is southwest. A contour map shows the average dip in eastern Iowa is 12 to 14 feet to the mile. In the extreme southeastern part of the State is a regional uplift that extends southwest into Missouri. This causes the contours on the St. Peter sandstone to swing more nearly north and south. The dip in this southern area is less. In Jefferson and surrounding counties it is as low as four or five feet to the mile. In northern central Iowa, the dip is nearly south, and slightly greater than in eastern Iowa. In the western and northwestern parts of the State an east component is present. The dip averages 15 to 18 feet to the mile southeast. In the southwest part of Iowa is a large shallow geosyncline that plunges at a low rate to the southwest. Rocks of Pennsylvanian age reach their greatest thickness near the axis of this geosyncline.

Norton[3], speaking of the Paleozoic rocks in Iowa, says: "They are for the most part apparently conformable with one another, but important erosional unconformities occur at the base of the Devonian system, and between the Mississippian, Pennsylvanian, and Permian series of the Carboniferous system."

Discussion of possible oil horizons:

The Platteville Formation

The Platteville is persistent throughout the State. It consists typically of a basalt shale, a median limestone, and an upper shale. The lower member, usually light green, is in places blue or blue-green. It varies in thickness from a few feet to a maximum of 160 feet at Charles City, in northern Iowa. Often it is 20 or 30 feet in thickness in wells. In the log of the city well[4] No. 1, at Fort Dodge, Webster County, brown, bituminous shale is reported from 1,388 to 1,408 feet. Above it is hard green shale and beneath it the porous St. Peter sandstone, 50 feet in thickness. This seems an ideal stratigraphic relation for oil or gas. The shale is so bituminous that it burns with a flame. However, the St. Peter sandstone is usually strongly water-bearing, and one would want an entirely closed structure upon which to locate. This might be hard to find since the area is drift-covered. The underlying rocks are of Permian, Des Moines, and St. Louis age. In the writer's opinion, this area is worth investigating with the view of finding such a structure.

The middle member, the Platteville limestone, varies considerably in thickness. In the city well at Fort Dodge, it is 10 feet thick, while at Manchester, in northeastern Iowa, it is 72 feet thick. Over the State it is typically compact, blue or gray, and more or less argillaceous. In wells at Des Moines, Boone, Fort Dodge, and Pella, in Marion County, it is dolomitic and might form a possible reservoir.

The upper shale member is usually thinner than the lower and in places wanting. Most well logs show it to be light-green or blue, but several in southeastern Iowa report it bituminous, and bituminous shaly partings occur in the outcrop of the Platteville limestone in Dubuque County. At Washington, in the county of that name, limestone and carbonaceous shale were reported at 963 to 1,020 feet. At Letts, in Louisa County, highly bituminous shale was encountered at 1,025 to 1,048 feet. Bituminous shales were also reported at Pella and Burlington. A number of wells have been drilled for water in this southeastern area. None has shown oil or gas. The Platteville limestone is hard and coarse-grained here. The Galena or Trenton limestone is the only possible reservoir. The base of this, at Washington and Letts, is magnesian, but not dolomitized, and hence not porous. In parts of this area, the Galena is dolomitic throughout, but it varies from 175 to over 200 feet in thickness. Oil from the thin bituminous shale might become disseminated throughout the dolomite, as the dip of the strata in this area is only a few feet to the mile; and would thus in no place be sufficiently concentrated to form a paying pool. This area may produce oil or gas, but it cannot be looked upon as favorable.

The Maquoketa and Shale and Galena Limestone

The Maquoketa shale overlies the Galena. The top of the latter formation is dolomitic in many places in eastern Iowa, and entirely so in wells west of Des Moines. In these regions it is porous. Its geologic equivalent, the Trenton limestone, has produced large amounts of oil in northwestern Ohio. This naturally makes its possibilities of interest in Iowa. In northeastern Iowa, at its outcrop, the Maquoketa consists of a basal shale, a median limestone, and an upper shale. The latter is 80 feet thick, the limestone 50 feet, and the lower shale 70 feet. Southwestward from this area, the formation usually appears as a single body of shale in the logs of the wells. At Des Moines, in central Iowa, it was reported only 33 feet thick; at Boone, 40 miles to the northwest, 105 feet; and at Grinnell, 50 miles a little north of east, 211 feet. In most well logs it is blue, bluish-gray, green, purple, drab or buff. In some, however, brown

(Continued on page 110)

System	Series	Formation		Thickness in ft.	Character of Rocks
Quaternary	Pleistocene	Wisconsin		0- 30+	Boulder clay, pale yellow, very calcareous
					Soil band
		Peorian		0- 30+	Boulder clay, yellow, with large boulders
					Soil, peat and forest beds
		Iowan			Boulder clay, yellow
		Sangamon		0-100+	Soil, peat and forest beds
		Illinoian			Boulder clay, blue, jointed, with intercalated streaks and pockets of sand and gravel
		Yarmouth		0-400+	Peat and forest beds, soil bands, aqueous gravels
		Kansan		0- 40+	Boulder clays, dark, friable
		Aftonian		0- 30+	Shales with soft limestones. In places chalky
		Nebraskan		150	Sandstones
Cretaceous	Upper Cretaceous	Colorado		100	Red shales and sandstones
		Dakota		20	Gypsum
Permian		Fort Dodge		20	Shales and limestones
Carboniferous	Pennsylvanian	Missouri		600	Shales and sandstones with some beds of limestone
		Des Moines		750	Limestone, sandstone and marly shales
		St. Louis		100	Largely crinodial limestone with heavy bands of chert, some shale
	Mississippian	Osage		265	Shale, sandstone and limestone. Limestone in places oolitic
		Kinderhook		120	Limestone, mostly brachiopod coquina
Devonian		State Quarry		(40)	Mostly shales (locally developed features; each lying unconformably on the Middle Devonian).
	Upper Devonian	Lime Creek		(120)	Shale
		Sweetland Creek		20	Limestones, shaly limestones, some dolomite in the northern counties.
	Middle Devonian	Cedar Valley		100	Limestones, shales, shaly limestones
		Wapsiponicon		60-75	Dolomite, not very fossiliferous. LeClaire phase extensively cross-bedded
Silurian	Niagaran	Garver		120	Dolomite, very fossiliferous in places
		Hopkinton		220	Shale, shaly limestones and locally beds of dolomite
Ordovician	Cincinnatian	Maquoketa		200	Dolomite in places; in places unaltered limestone
	Mohawkian	Galena		340	Marly shales and limestones
		Platteville		30	Sandstone
		St. Peter		100	Dolomite
	Canadian	Prairie du Chien	Shakopee	80	Sandstone
			New Richmond	20	Dolomite
			Oneota	150	Coarse sandstone
			Jordan	100	Dolomite, more or less arenaceous
Cambrian	Potsdamian or Saratogan		St. Lawrence	50	Sandstone, with bands of glauconite
			Dresbach	150	Quartzite
Algonkian	Huronian		Sioux Quartzite		

[1]The writer wishes to thank Dr. F. B. Raymond of Harvard University, for his kindness in going over this article, and to acknowledge his assistance and correction of same.

[2]George F. Kay. Report of the State Geologist, Iowa Geological Survey. Vol XXIII, 1912, Pl. XXVI.

[3]Norton, H. H., Water Supply Paper 293, U. S. G. S., 1912; p. 60.

[4]Reference is made in this instance, as well as in numerous others throughout this article where details of well data are cited, to Water Supply Paper 293 of the U. S. Geological Survey, from which these figures were obtained.

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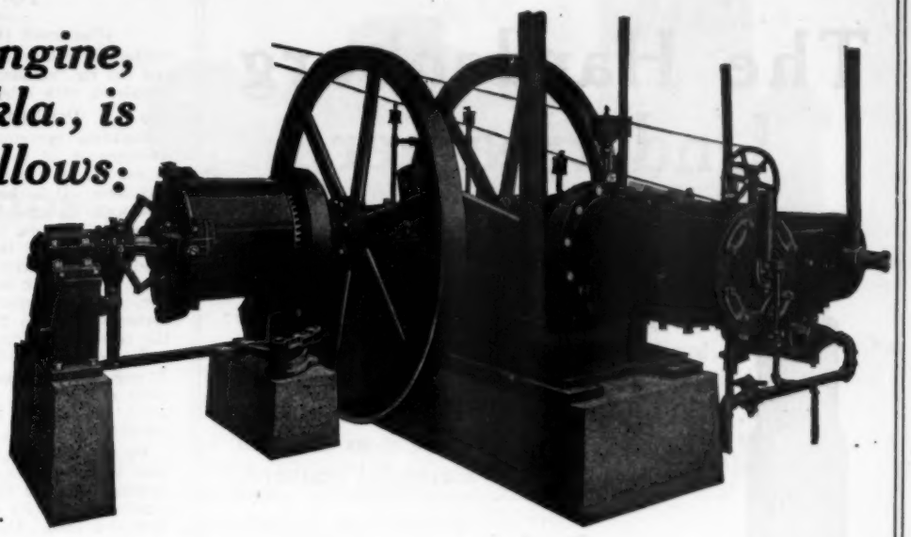

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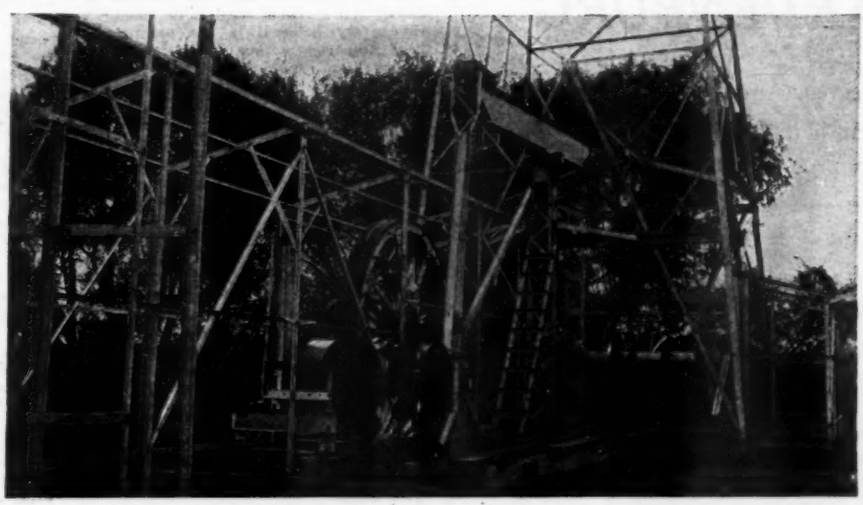

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DRILLING METHODS IN TONKAWA FIELD

(Continued from page 84)

weeks, the rotary outfit is moved away and the rig "standardized" and the well completed with cable tools.

Development Policy

Tonkawa operators are pushing the development of their properties to the fullest extent, especially along the property lines. It is the policy to drill separate wells to produce from the different oil sands. Owing to the large area in which the lower Hoover and Tonkawa sands are productive the drilling of twin wells to these two sands is common practice. On the properties in the northwest corner of Section 2-24-1, which is now the center of drilling activity, three oil wells are being drilled at one location. At one location on one of these properties there will be three oil wells and two gas wells when the present program is complete.

Practically all of the oil wells in this part of the field are being drilled with rotary tools and the first well on the location is usually carried down to the Tonkawa sand. Core samples are taken of the shallower oil sands to determine their correct depth and contents to provide information for the drilling of subsequent wells to the sands. New rigs are generally being built for each additional well, but in several instances the original rotary rig has been skidded about 50 feet, for use in drilling the next well. Where rigs have been skidded, smaller derricks, generally of steel, have been erected over the original well.

Casing Programs and Water Exclusion

The protection of the oil and gas sands from water infiltration and the prevention of loss by migration from one formation into another is an important factor in the operation of an oil property. In the Tonkawa Field the problem of protecting the oil and gas sands has become one of prime importance because there are five known oil sands between which water sands occur. Unless special attention is given to the proper protection of these oil sands, either by a systematic casing program or by some other satisfactory method, water sooner or later may damage some of the oil bearing sands.

In the Tonkawa Field the usual method of casing wells drilled with rotary tools is different than the method of casing wells drilled with cable tools. In the rotary holes it is the practice to land and cement one string of casing above the oil sand, from which the well is to produce. In cable tool holes it has been the policy of some of the companies to land strings of casing above and below each of the upper productive oil sands which have been drilled through.

In most of the cable tool holes in the Tonkawa Field 20-inch casing was landed as a surface conductor at an average depth of about 85 feet, and 15½-inch or 12½-inch casing was set below the gas and water sands found between 800 and 900 feet. The 10-inch casing was usually set between 1,700 and 1,800 feet to exclude upper water and thus facilitate drilling. In addition this casing was set to prevent the passage of upper waters into the lower oil sands. Where the upper Hoover sand was found unproductive and it was desired to produce from the lower Hoover, a string of 8¼-inch casing was landed below the middle Hoover sand, which usually carries water.

In cable tool drilled wells, producing from the Tonkawa sand, an additional string of casing was landed, and in some wells cemented, between the lower Hoover sand the intermediate water sand found below to protect the lower Hoover sand from water. The final water string was landed either just below the intermediate water sand or near the top of the Tonkawa sand. When the water string was landed just below the intermediate water sand a liner was set on top of the Tonkawa sand.

In most of the rotary drilled holes a 15½-inch or 12½-inch conductor is set and cemented at about 50 or 60 feet. In practically all rotary drilled wells an 11-inch bit is used to drill to the casing or water shut-off point. The 8¼-inch casing is usually landed and cemented in this size hole. From 150 to 600 sacks of cement have been used to cement these wells. One company is now using about 600 sacks of cement in all the deeper sand wells in order to fill the annular space between the outside of the casing and the wall of the hole from the shoe of the water string to the surface. In one well this company reported that from 25 to 50 sacks of cement were circulated from the hole. About 100 gallons of quick setting compound is added to the last 200 sacks of cement pumped into the wells by one company. The Halliburton process is used in cementing wells in the Tonkawa Field.

In the cementing of oil well casing there is some danger of the cement channelling through the mud and thus not completely replacing the mud. Regarding the preparation of rotary drilled holes for cementing, F. B. Tough, chief petroleum technologist of the Bureau of Mines, in an address before the American Petroleum Institute at St. Louis, Mo., on December 6, 1922, stated:

"A great deal of cementing has been done in rotary holes where the cement is in contact with mud fluid. It has been assumed that because the cement mixture is a good deal heavier because of its higher specific gravity than the mud in the hole that those two fluids are going to take relative positions according to specific gravity. That is partially true, but like a great many part truths, it is dangerous, for it omits some of the important facts. One of the most important of these is the question of viscosity, or in some cases, plasticity of the mud."

Mr. Tough also pointed out that a small increase in the specific gravity may result in channelling of the cement through the mud fluid. Laboratory experiments by the Bureau of Mines showed a sharp separation when a cement mixture of specific gravity 1.9 displaced mud fluid of 1.15 specific gravity. Whereas, cement of the same specific gravity spiraled up through mud fluid of 1.3 specific gravity.

The Bureau of Mines recommends that a thorough test be made of the water string in order to determine whether upper water has been effectively excluded from the well. This test should be made before the well is deepened to the oil sands. It is the policy of one operator in the Tonkawa Field, where the water string was cemented, to bail the hole dry after drilling out the cement plug and allow the well to stand undisturbed for 24 hours. If no water entered during this time the well was then deepened to the oil sands. This is good practice, as it insures detection of comparatively small leaks around the shoe.

The completion of twin and even triple oil wells at many locations in order to produce from the various zones separately makes necessary the use of effective methods for protecting these sands from loss of oil and gas by migration and damage by infiltrating waters. Except for the method involving the cementing and careful testing for water shut-off of separate strings of casing between each oil and water sand, the methods usually employed in the field for the protection of upper oil sands cannot be absolutely relied upon. However, if separate strings of casing were cemented between each water sand and productive oil sand in the Tonkawa Field, at least two additional water strings where the middle Hoover carries oil and four additional strings where the middle Hoover carries water in addition to those ordinarily used would be required for a well drilled to produce from the Tonkawa sand. Further study shows moreover, that this casing program does not provide for the protection of the three upper gas zones. In most cases, several strings would be required for

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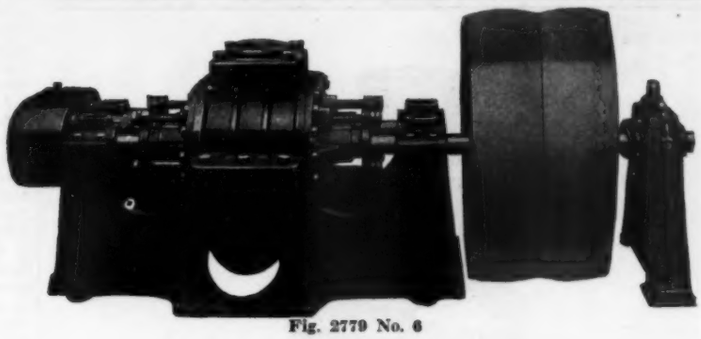

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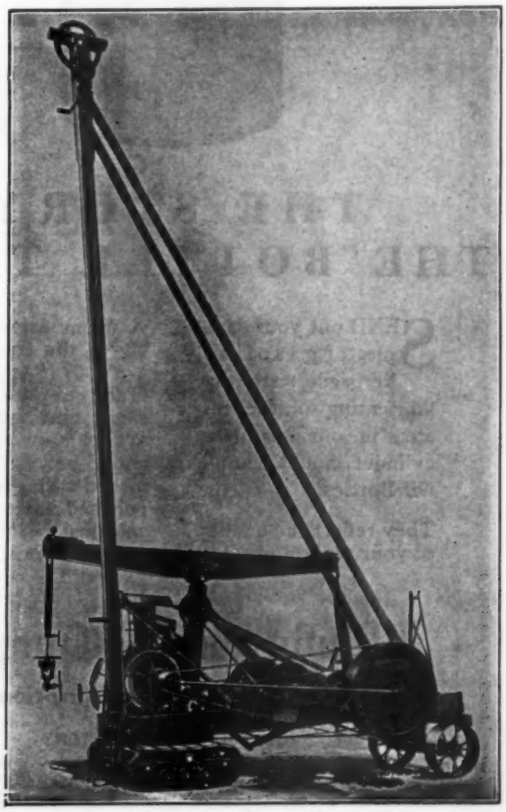

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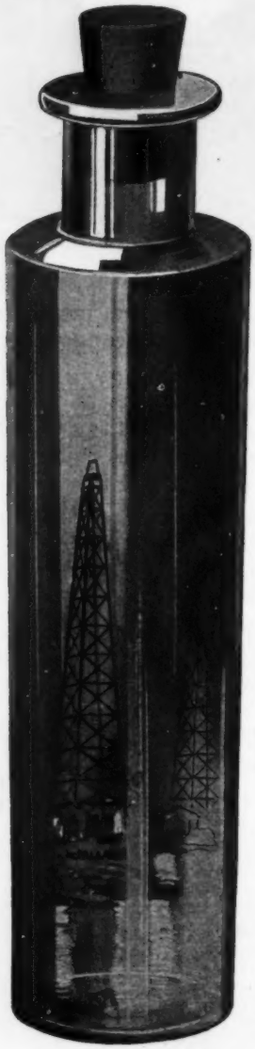

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the proper protection of these upper gas sands when casing alone is used. Clearly such a casing program is not practical in a field such as Tonkawa where there are water bearing formations between a number of the productive oil and gas sands.

In the Tonkawa Field, the Bureau of Mines recommends that the final water string be cemented above the oil sand from which it is planned to produce. Although sufficient cement has been used in some wells to fill the annular space between the casing and the wall of the hole from the shoe of the water string to the surface, this practice in all cases may not give the protection desired to upper productive formations. Agitation due to possible movements of oil, gas or water may prevent certain portions of the cement column from setting so as to effectively prevent the migration of fluids back of the pipe.

When oil, gas and water bearing formations are cased off behind a single water string, the use of a column of mud fluid behind the water string and above the cement placed back of it, will in many cases effectively prevent the migration of fluids from one formation to another. However, the solid particles in the mud fluid may settle, leaving clear water around the upper part of the casing. Also it is possible that this clear water or even the mud fluid may eventually seep away into a porous formation, particularly if oil or gas is being taken from such a formation in a nearby well. Caving of the formations back of the pipe sometimes may bridge the hole so as to support the column of mud fluid above the cave and thus decrease the hydrostatic lead on the fluid below the cave.

Where mud fluid is depended upon to protect upper oil or gas formation, it is good practice to occasionally run in additional mud fluid in order to maintain the column of mud to the surface. This practice should be encouraged particularly in the Tonkawa Field as an added measure of protection to the upper gas sands. Observation showed that a sample of rotary mud taken from the rotary ditch while drilling below the upper oil sands at a depth of 2,250 feet in the Tonkawa Field upon standing five days had settled until the upper 30 per cent was clear water and the remaining 70 per cent heavy mud fluid.

PROGRESS MADE IN FIELD WORK AND REFINERIES IN CALIFORNIA

J. W. Fuqua, retiring president of the Chamber of Mines and Oil of California, in his address before the annual meeting of the chamber in Los Angeles recently, recited the history and the development of the field and brought out some data on standardization of equipment, refining and cracking, gasoline extraction and absorption, geology and coring and rotary drilling that is worthy of reproduction. In the course of his address Mr. Fuqua said:

Geology, Coring and Rotary Drilling

In the early history of rotary drilling work in California it was thought from the experience then gained that the method would not only be impractical for general drilling work in the hard California formations, but that it would be impossible, through the circulation of mud laden fluid, to accurately or reasonably determine the depth where water shut-offs should be made. The complications that resulted in the work were plentiful and numerous and brought out the mechanical imperfections together with the unskilled and improper handling in process of drilling, but like all things in which there is an incentive for advancement, mechanical ingenuity began to play its part in the development and production of suitable equipment for rotary work, which automatically broadened the experience of rotary drilling, and it was not long thereafter until it was definitely and conclusively proven that rotary equipment and skilled services could be successfully used in the drilling of California formations. Rotary work in California drilling has now advanced to a technical and scientific stage not only in depths above water shut-offs, but in the final finishing of the wells through the oil formations. New appliances are being constantly tried out, some of which produce surprising and gratifying results, the most advantageous and latest of which is the process of taking core samples of formations in the place that is being penetrated by the drill, and it is generally recognized by the oil fraternity as being one of the greatest recent improvements. The coring process, the most modern mechanical means known to the science of drilling oil wells, has given to the geologist the first and real opportunity of studying the formations being drilled through, and to make such classifications as those which the science is able to correlate, which broadens the general scope of knowledge concerning underground conditions, and gives to the operators an intelligent and comprehensive understanding of those things which heretofore were involved in a dark cloud of uncertainty.

Some very interesting geological discoveries and determinations have been made through a careful study and analysis of the cores, and it has been and is possible to correlate a certain strata or zone in one field with that of another strata or zone in some other field of southern California. In the study of these core formations the geologist takes into consideration the physical characteristics, the minute microscopic organisms known as foraminifera, the mineral content, and other things too numerous to mention, all of which come in for their part in the work of conveying to us their meaning and relationship to the thing that we are trying to establish and develop.

Standardization of Oil Field Equipment

At the third annual meetng of the American Petroleum Institute held in St. Louis, Mo., on December 6, 7 and 8, 1922, the subject of standardization of oil field equipment was discussed, and the wave of such necessity has broadcasted itself over California. Several conferences have already been held in our State on this subject, and while there is a difference of opinion between the standardized schedules as submitted in the East, compared to the specifications that would seem most desirable for California operations, it can be said that some general good is ultimately going to result from these meetings. There is much benefit to be derived from the general standardization of all oil field equipment, not only in the convenience in the matter of sizes, but in the matter of quality. This must not, however, be construed to mean the establishment of a standard of material or equipment that is never to be varied in either size or quality, as this would mean nothing less than stagnation and decay. Oil field development is constantly demanding better equipment for not only the purpose of drilling wells with less mechanical difficulties, but drilling deeper producing wells than have ever been drilled before, and the mills and manufacturers of oil well equipment must be alert and prepared through scientific apparatus and skill to not only detect all imperfections but to advance and improve the quality of their product, and also be prepared to change sizes in the event that modern oil field methods should justify such changes. I assume, in the event that the operators, manufacturers, and mills should agree upon a standardized product, that the general policy of such standardizaton would be handled through

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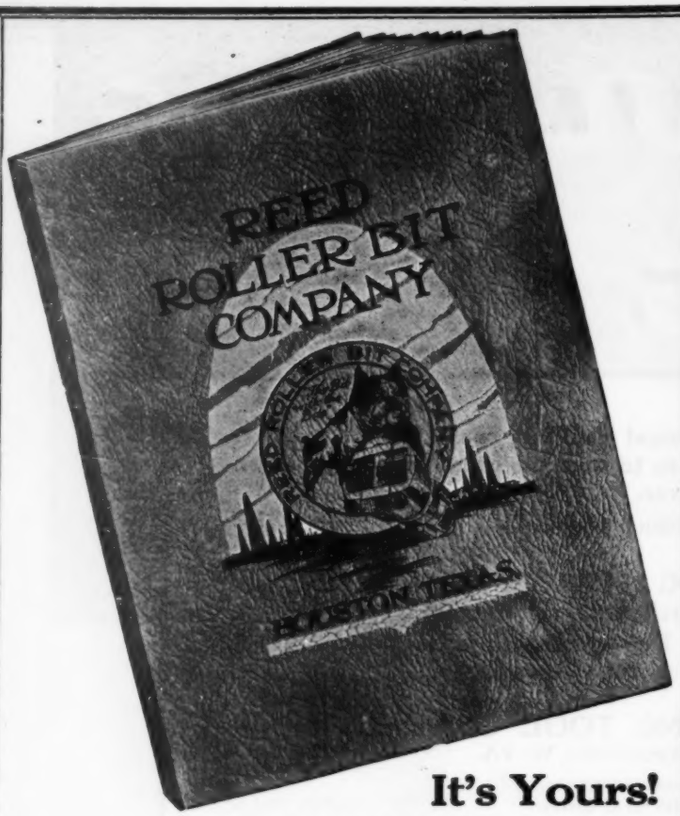

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Refining and Cracking

The refining operations in the State of California have been greatly improved the last few years. The continuous process of distillation has been installed wherever practical and is not only productive of better results but is a material factor in the reduction of operating costs, and makes it possible to handle larger quantities with less expense. When refineries first started in operation in California there was only a very limited amount of good grade refinable crude; the largest production consisted of fuel-crude or what might be termed a low grade refinable crude. About 10 years ago, average refinable crude produced in California yielded only about 3½ per cent of gasoline, but through improved refinery methods and a gradual increase of a higher quality of crude oil, the yields today are running about 15 per cent, and while the proportion is not the same, there have also been important mechanical improvements made for the production of lubricating oils and other products.

A number of years ago it became apparent that it would probably be advisable to provide some mechanical means to convert some of the heavy residuum stocks into a product suitable for automotive operation and in this connection the cracking process was employed and has been used quite extensively at times and where there was a shortage and scarcity of gasoline. The potential production of gasoline by the cracking process is receiving due consideration, but this method of manufacturing gasoline will only be used when the price of the product will permit its manufacture profitably.

Gasoline Extraction and Absorption

A good many years ago the Eastern oil fields in the United States installed compression and absorption systems for the purpose of extracting gasoline from natural gas, and as this process developed quite satisfactory results the conservation wave finally reached California, and during the last few years almost all of the gas produced in this State, except the dry or unprofitable gas, has been put through a mechanical process for the extraction of gasoline, and it has developed into quite an extensive and profitable business. From the very recent large gas production in southern California resulting from the development in Huntington Beach, Signal Hill, and Santa Fe Springs districts, there has sprung into existence 17 extraction and absorption plants that have a capacity of about 75,000 gallons of gasoline per day, with 18 similar plants in the course of construction which should have a capacity of approximately 80,000 gallons of gasoline per day. The new installations are progressing as fast as it is possible to obtain mechanical means and labor for this purpose, and everything is being done that can possibly be done to take care of the present situation.

OIL DEVELOPMENT IN SOUTHWEST INDIANA

John R. Reeves of the State Geological Survey of Indiana presented a paper before the recent meeting of the American Institute of Mining and Metallurgical Engineers in New York on Oil Development in Southwestern Indiana, in which he brought out the following interesting facts:

Petroleum production of southwest Indiana is for the most part concentrated in Sullivan, Pike and Gibson Counties. The first of these is represented by the following pools: Heims, Dodd's Bridge, Denny, Scott, Harmon and Bragdon. Of these, only the Heims and Dodd's Bridge are now producing any appreciable amount of oil. Pike County is represented by Oatsville, Davison, Bowman, and East Petersburg Pools. The first two of these pools are comparatively new; the Oatsville is the largest producing pool in this region. Gibson County is represented by West Princeton, East Princeton, Union or Hazleton, Wheeling, and Francisco Pools. A few other pools are scattered over the southwestern part of the State as follows: The Monroe City Field in Knox County, the Jacobs Pool in Daviess County, the Loogootee in Martin County, the Riley Pool in Vigo County, and the Terre Haute Pool at Terre Haute, Vigo County.

The production for southwest Indiana shows a decrease in 1922, of approximately 50,000 bbls. The production for 1921 being 876,500 bbls. and for 1922, 824,966 bbls. These figures are from the Illinois Pipe Line which takes 98 per cent of the oil from this region.

Development during 1922 was rather slack because of the low price of crude oil; however, some new territory was opened up.

Chief among the new developments is the Monroe City Field, where four producing wells and three dry holes were drilled in 1922. The fourth producing well, on the Doty lease came in at about 150 bbls. which is much larger than the other wells, and apparently extends the field about a mile to the south. Development of this field has been slow. As the first well was drilled in 1920, however, it is believed that with the Doty well making 150 bbls. flush production, more drilling will be undertaken. Production is obtained from two sands, the first about 1,250 feet deep and the second about 1,450 feet deep. The Ohio Oil Co., the North Side Oil and Gas Co. and Perry Andrews are chiefly interested in this field.

The Francisco Pool, west of Francisco in Section 13, was discovered in 1922; at the end of the year five producing wells and three dry holes had been drilled. Production is obtained from the Oakland City sand at a depth of about 1,450 feet.

The producing wells have varied from 10 to 100 bbls. flush production.

The Buckeye Oil Co. drilled in a well on the Mauck lease in Section 29, Washington Township, Gibson County in semi-wildcat territory. After several months it is still pumping about eight bbls. Production was obtained from a new sand between the Old Brown and the Vierling sands at a depth of 1,556 feet.

The People's Petroleum Co. drilled a well on the Hurt lease near Arthur in Pike County that is making 10 bbls. daily. A new well is drilling the north offset of this well. These wells are adjacent to old proved territory that has been abandoned.

The Oatsville Pool has been extended to the east and north. In the northwest of Section 23, the Weiser Oil Co. drilled three wells on the W. Phillips lease, each of which is making 80 bbls. The Goodluck Oil Co. drilled two wells on the Loveless lease just north of the Phillips, which are making about 30 bbls. The A. B. C. Oil Co. drilled two producing wells on the Beck lease, northwest of Section 24. Production in these wells is coming from the Oakland City sand. Conditions point to a farther extension of the field to the east, as the geologic structure apparently extends farther to the east than any wells drilled.

All attempts to extend the field to the north have resulted in dry holes, as the sands pinch out in that direction. This is especially true of the Oakland City sand.

The Noble-Bolyard Co. drilled the sixth well on the Huey lease in Section 27 in the southern part of the field. This is the only well producing from the Barker sand in the field although several wells have had a showing.

Wm. Zeller and associates drilled a well south of Bicknell, which made about 10 bbls. The second well is now drilling.

Dry holes have drilled in wildcat territory as follows: Near Chandler, Warrick County, near Glendale, Daviess County, near Bruceville, Knox County, and north of Winslow, Pike County.

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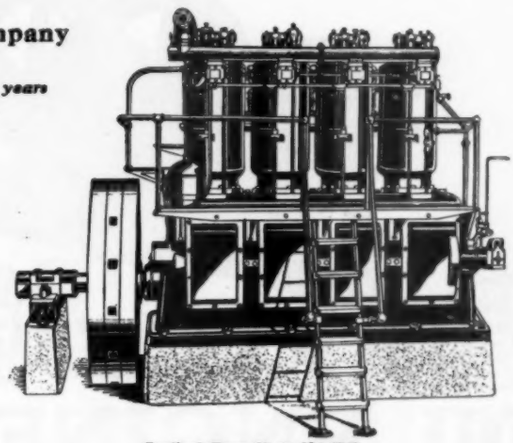

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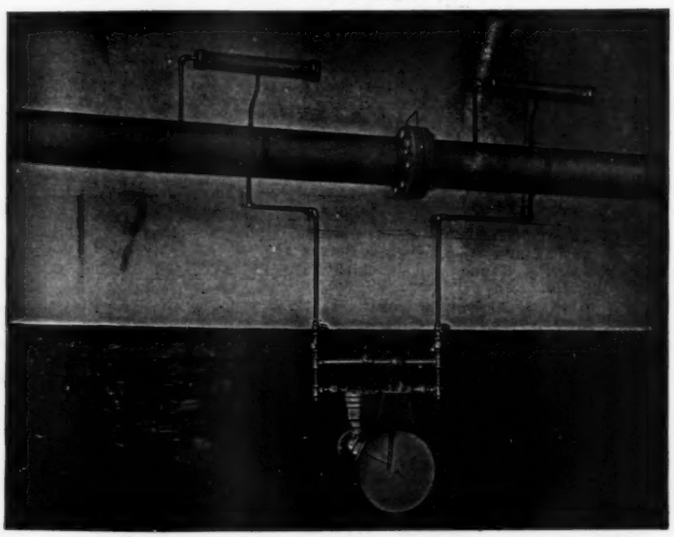

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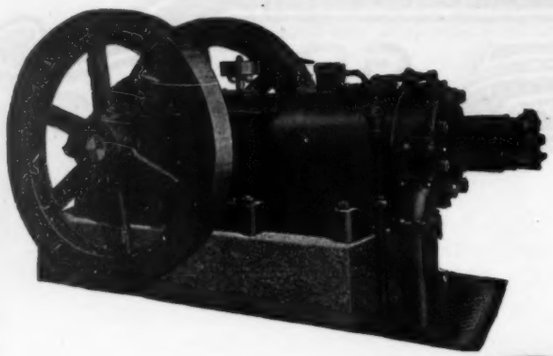

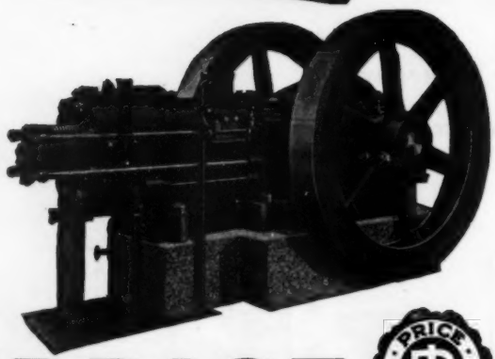

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DE GOLYER ON THE FIELDS OF MEXICO

Adds An Important Chapter to the History of the Field and Expresses Confidence That Its Future Is Brighter Than Many People Imagine. Believes Fields Affected By Salt Water Have Yet Good Staying Qualities. Little Wildcatting.

The following address on "The Production of Petroleum in Mexico during 1922," was delivered by Edward De Golyer, vice president and general manager of the Amerada Petroleum Corporation, delivered before the American Institute of Petroleum Technologists division of the American Institute of Mining and Metallurgical Engineers, in New York, February 19.

Mexico—second only to the United States as a petroleum producer—produced approximately 180,000,000 bbls. of petroleum in 1922, a decline of some 14,000,000 bbls. from 1921 production. Exports increased about 8,500,000 bbls. over 1921 exports and were practically equal to production. Increased export, notwithstanding decreased production, was possible only by drawing on stocks for approximately 12,000,000 bbls., a quantity sufficient to supply Mexico's domestic consumption.

The official preliminary estimate of 1922 production, based on tax returns for the first 11 months, is 179,265,000 bbls. Mr. Blardone, representative of The Oil and Gas Journal and an authority on operations in the Mexican fields, estimates it at 184,419,685 bbls.

All estimates agree that there was a marked decline in production, variously estimated at 14,000,000 to 18,000,000 bbls. from that of the previous year. The rate of production during the year declined from 20,641,862 bbls. during January—the high point in Mexican oil history—to approximately half that amount during December.

Mexican petroleum, with few minor exceptions, is of two distinct grades; the so-called "light crude," produced in the southern fields or the fields extending from the old Dos Bocas Pool to the Alamo Pool and including the Chiconcillo, Tepetate-Casiano or Chinampa, Naranjos or Amatlan, south Amatlan, Toteco, Cerro Azul, Potrero del Llano-Alazan, Cerro Viejo, Tierra Blanca, Chapapote Nunez, and Alamo Pools, and the "heavy crude," produced in the Panuco River valley fields, including the various pools which make up the Panuco Field, the Ebano Field, the Chijol Field, and the Topila Field. The light crude ranges from 19 degrees Baume to 22 degrees Baume in gravity and is more valuable for refining purposes than the heavy crude which ranges from 1 degrees Baume to 15 degrees Baume and is chiefly a fuel oil.

Light Oil Output Less

The loss in production during 1922 was entirely of the light crude and it was offset to a considerable extent by the increased production of the heavy crude resulting from the discovery of the Cacalilao extension of the Panuco Field. The best available estimate of production by months during the year is as follows:

	Panuco Valley	South Fields
January	3,595,145	16,774,964
February	3,444,437	13,786,133
March	3,792,908	14,622,300
April	3,379,332	12,368,248
May	3,682,217	13,021,470
June	3,378,630	14,335,713
July	2,925,000	11,441,943
August	3,369,800	8,659,501
September	2,273,000	8,241,016
October	3,208,000	8,289,691
November	4,381,000	7,414,571
December	4,307,000	7,910,151
Total	41,636,469	136,865,700

It will be noted that at the beginning of the year more than four-fifths of the current production was light crude, but at the end of the year not more than three-fifths was of that grade.

The loss in light crude production was due chiefly to the decline of the Toteco-Cerro Azul Pool, where salt water appeared in late June or early July and was offset to some extent by production from the developing Tierra-Blanca-Chapapote Nunez Pool.

The Toteco-Cerro Azul Pool, including south Cerro Azul, had an estimated daily average of 516,000 bbls. during the week ending December 22, 1921. This was the high point. Production continued at 400,000 to 450,000 bbls. daily until mid-March, when it was dropped to approximately 350,000 bbls. daily by the interested companies, apparently in an attempt by agreement among themselves to conserve and lengthen the life of the pool. Production for the week ending June 30, averaged approximately 353,000 bbls.; for the week ending July 7, 308,000 bbls. Salt water had appeared. The approximate daily average for the week ending July 14 was 212,000 bbls., and for that ending July 20, 151,000 bbls. For the week ending July 27 control of the wells was better in hand and production averaged approximately 187,000 bbls. This was the high record after the salt water invasion, and from this point production continued to decline sharply until by the end of the year the daily average was approximately 88,000 bbls. These estimates include all of the Toteco and Cerro Azul haciendas including south Cerro Azul, which is probably a separate pool. The Toteco-Cerro Azul Pool proper, in which the real decline occurred, was producing approximately 56,000 bbls. daily at the end of the year.

Exports 180,862,239 Bbls.

Exports are officially estimated at 180,862,239 bbls. for the year, according to the tax department of the Secretaria de Hacienda. Receipts of Mexican petroleum into the United States amounted to 124,852,048 bbls. of crude and topped petroleum besides a certain amount of refined products.

The classification of Mexican exports by volume is as follows:

	Bbls.	Percent of Total
Light crude	66,739,774	36.9
Heavy crude	42,579,853	23.5
Fuel oil	59,931,572	33.1
Gas oil	165,634	0.1
Crude gasoline	7,067,185	3.9
Refined gasoline	2,483,531	1.4
Refined kerosene	1,430,364	0.8
Lubricants	95,148	0.1
Asphalts	369,178	0.2

Imports of heavy oils into the United States are classified as follows:

	Bbls.
Light crude	65,964,206
Heavy crude	33,291,208
Fuel oil or topped	25,596,634

Exports of heavy Mexican crudes and topped oils by months did not vary greatly during the year but the exports of light crudes, the principal refining grade, decreased most notably, as will be seen from the following table:

	Light	Heavy	Topped
January	8,357,963	3,578,368	4,366,353
February	8,184,724	3,807,531	3,587,102
March	8,262,550	3,591,426	4,425,467
April	7,526,562	4,007,774	4,765,962
May	8,544,637	3,471,344	4,923,535
June	6,033,846	3,326,087	5,465,390
July	6,700,729	2,869,469	6,513,144
August	3,805,733	3,033,761	5,344,336
September	2,431,530	2,947,078	4,489,539
October	3,085,632	3,997,295	5,612,774
November	2,207,186	2,966,134	4,743,677
December	1,598,685	4,189,586	5,296,900
Total	66,739,768	42,579,853	59,931,572

Available tankage in Mexico is officially computed to amount to 80,774,161 bbls. This apparently inculdes earthen storage and 3,000,000 or 4,000,000 bbls. of concrete storage as well, since steel storage is estimated at 56,265,453 bbls.

Official estimates of stocks are not available but it seems probable that at the present time the steel and concrete storage is not more than a quarter filled. Mr. Blardone estimates Mexican stocks January 1, 1922, as 25,300,515 bbls., and stocks January 1, 1923, as 13,452,048 bbls. These estimates indicate that stocks

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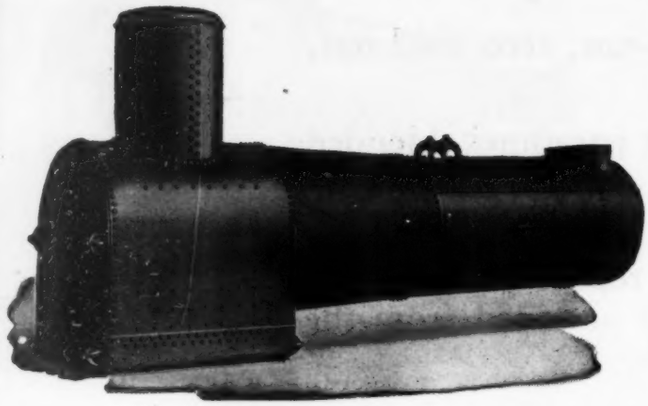

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were drawn upon to the extent of 11,848,431 bbls. during the year. During the previous year they had been increased by 18,710,267 bbls. He estimates the stocks of light crude at 4,276,295 bbls. at the end of 1922, as compared with 11,308,414 bbls. at the beginning of the year.

The United States Geological Survey estimates stocks of Mexican light and heavy crudes and topped oils held in the United States at 16,165,000 bbls. as of December 31, 1922. The high point for Mexican stocks held in the United States was June 30, 1922, when they amounted to 23,422,000 bbls.

Field Operations

According to official estimates, 251 wells were completed during the year, of which 154 were producers and 97 were dry holes. According to Mr. Blardone's estimates, probably the more exact, 279 wells were completed of which 113 were producers and 166 were failures.

Successful field operations during the year were confined, firstly, to the final development of the Toteco-Cerro Azul Pool; secondly, to the discovery or development of various areas, not previously explored, along the line of the Dos Bocas-Alamo ridge—the so-called "golden lane" of Mexico; thirdly, to the further perfection of the technique of producing from "strippers"—wells in which salt water has appeared; and fourthly, in the development of the important Cacalilao extension of the Pauco Pool, various minor pools in the Panuco and Topila areas, and the further development of the Ebano-Chijol area including Limon.

Unsuccessful field operations in the Tampico-Tuxpam region were confined, for the most part, to attempts to find the supposed extension of the Dos Bocas-Alamo ridge south of the Tuxpam River, to find its northern extension in Cabo Rojo, to find production in the Tamasopa limestone west of the ridge, to develop independent structures at San Javier, Pecero, Palma Sola, and to attempts to discover independent pools along the Panuco-Sierra Tamaulipas arch. In southern Mexico were continued the efforts to develop deep production in the old Sarlat Field, Tabasco, to discover further lateral sand pools around the salt domes of the Isthmus of Tehuantepec and to overcome technologic difficulties and thus establish production in the lateral sand pool of Concepcion, which was discovered late in 1921.

Future of Mexico

What we chiefly require now, whether interested directly in the development of Mexican fields or indirectly in Mexican production because of the effect of imports on the price situation in the United States, is a sane and sound conception of Mexico's present and potential position as an oil producer. It is not an El Dorado of inexhaustable pools, as various persons interested largely in the market position of certain oil stocks may have intimated, nor is there any possibility of such abrupt failure in production as has been indicated by those feeling the menace to the oil producer of the United States of floods of extremely cheaply produced, low-priced Mexican crude.

The staying power of Mexican fields, in which salt water has appeared, seems to have been very much under-estimated. The Potrero Pool, where salt water appeared in 1918, produced three-quarters of a million bbls. more in 1922 than in 1919, the year immediately following the appearance of water. Tepetate-Casiano, which went largely to water in 1919-1920, produced three-quarters of a million bbls. more in 1922 than in 1921 (4,566,020 and 3,874,282 respectively). These are the first two fields in which water appeared. As has been previously stated, the technique of producing oil from strippers—wells in which salt water has appeared—has been very much improved during the past year. Wells which, by use of ordinary gate valves, were stepped down 4,000 or 5,000 bbls. at a step from daily productions of 30,000 to 40,000 bbls., with recurrences of water and emulsion appearances, and were finally closed as no longer productive in the excitement of the early stages of field decline, have been re-equipped with manifolds, which permit them to be produced through chokes as small as ¼-inch, and through careful handling have been brought back as important producers.

A well on lot 190 Amatlan which was entirely closed as non-productive in September, 1921, was later re-opened, has since produced more than three-quarters of a million bbls. and now produces some 1,700 to 2,000 bbls. daily. Other wells have had similar records. A well in the Alazan Pool has been producing intermittently for four years since the first appearance of water, has produced more than 2,000,000 bbls., and now produces approximately 2,000 bbls. daily. The production of petroleum with salt water is no rare thing—more than half the oil produced in the United States is from wells which have shown or now make salt water, and wells are being drilled in the older Mexican pools today for "strippers."

Little Wildcat Drilling

Mexico has always suffered because wildcat drilling was not conducted on a scale commensurate with maintenance of production. This is due to many causes. The unsettled condition of the Mexican Government's program of oil legislation has been an important factor in bringing about this result, as have revolutionary and bandit activity, but the chief deterring factor has been the condition under which oil occurs. As long as a corporation or individual owns potential production far in excess of market or pipe line capacity, it is difficult to realize the necessity for active search for new pools. When production declines and the wells pass to the stripping stage, the decline is sharp and immediate, and within very few months an entire field is in the stripping stage. Necessity for wildcatting becomes immediately apparent, but operations move slowly and necessary drilling can not be done in a few months or even a year.

Mexico is no longer a menace to the American producer, nor is it likely to become so again, though there may be and probably will be new fields discovered comparable to those already known. This condition has been brought about as largely by the development of facilities for increased consumption in the United States as by the decline in Mexican production.

MEXICAN OIL EXPORTS DECLINED IN JANUARY

NEW YORK, Feb. 24.—Complete figures of oil exports from Mexico in January show that 11,823,401 bbls. were shipped, a decrease of 523,290 bbls. from December, the daily average dropping from 398,280 bbls. to 381,400 bbls., according to the Wall Street Journal.

Contrasted with the loss of 846,467 bbls. in shipments by the Mexican Eagle was an increase of 347,203 bbls. for The Texas Co., whose exports in January were larger than any other month in the past two years, with the exception of February, 1922.

The following tabulation shows exports by companies for January, compared with December, 1922, in bbls.:

	January	December
Mexican Petroleum	3,290,004	3,661,577
Royal Dutch (Corona Co.)	1,782,880	2,048,740
The Texas Co.	1,051,726	704,522
Gulf Oil	972,593	784,685
Mexican Eagle	945,403	1,791,870
Standard Oil of N. J.	758,300	751,592
Sinclair	564,847	466,965
East Coast	553,842	534,436
Atlantic Gulf	417,776	363,366
New England Fuel	382,895	88,259
Mexican Seaboard	250,949	328,766
Empire Gas and Fuel	277,333	166,332
Chaddick & Co.	108,950	.....
Atlantic Lobos	107,879	162,092
Island Oil	69,415	239,211
Pierce Oil	63,495	18,584
Interocean	55,994	46,614
U. S. Mexican	42,784	41,889
Tal Vez	26,336	.....
Panuco-Boston Oil	.....	203,393
Total	11,823,401	12,346,691
Daily average	381,400	398,280

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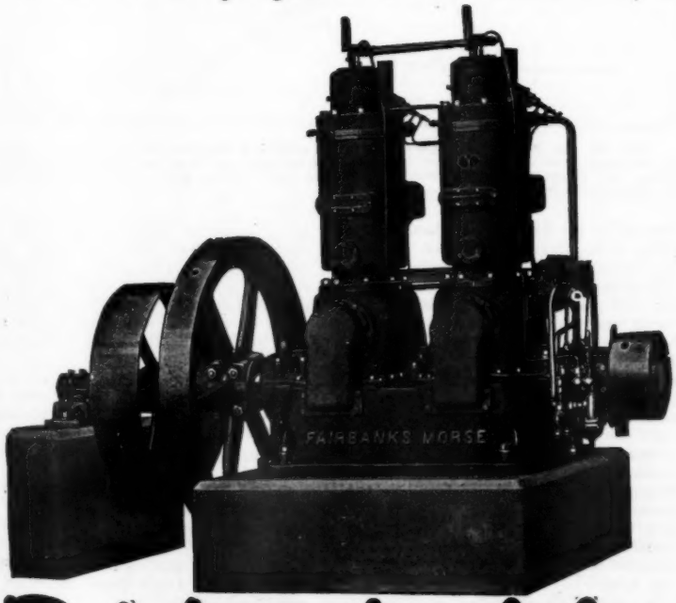

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WIRE LINES FOR DRILLING

INTENSIVE DRILLING IN CALIFORNIA

Rush to Get Production and the Fact That New Big Pools Are Being Very Closely Drilled on Town Lots Will Mean a More Rapid Exhaustion of That Wonderful Field—Peak May Come This Year—New Methods of Drilling.

At the meeting of the American Institute of Mining and Metallurgical Engineers held in New York last week a paper on Oil Development in California, prepared by Wayne Loel and Van Court Warren, was read. Extracts from the paper are given below:

On presenting the oil situation in California, the writers have thought it best to deal broadly with the conditions in the State as a whole, laying special emphasis on the extraordinary status of the recently discovered fields in the Los Angeles basin. Had it not been for the enormous production of the new fields in the southern part, California would not now be facing an oil crisis, comparable only to that brought about by the abnormal conditions in 1915.

Production

Production in California for the year 1922 was 139,626,876 bbls., exceeding last year's production by 24 per cent. This extraordinary increase was brought about by the three fields recently discovered in the Los Angeles basin. These fields alone, during December, produced more oil than all the rest of the State. No immediate market could be found for such an enormous increase, with the result that during the year 25,000,000 barrels of oil was placed in storage. Every effort has been made, on the part of the larger companies, to curtail production, but without success because each of the new fields is situated on land sub-divided into city lots, thus enabling hundreds of small companies to drain the pool as rapidly as possible. Whenever large tracts of land are held, especially in the older fields, production has been shut in as far as practicable; but, notwithstanding, the production curve is going up at an alarming rate.

Town-lot development results in the rapid draining of a pool at an enormous proportionate cost with the added result that extraordinary facilities are needed to handle the peak output, which must afterwards be scrapped unless new pools are discovered as fast as the old ones are exhausted, which condition is not likely to continue over many years. From this time on, the curve shot upward rapidly until a production of nearly 2,000,000 bbls. per month was reached during December. The production of this field will probably not be greatly increased since the present low price of oil will retard drilling in the deep sand, while the upper horizons are falling off rapidly.

Santa Fe Springs stands in the same position as Huntington Beach, with regard to exhaustion, the upper sands being largely exhausted while the lower sand is being depended on to maintain production.

Long Beach is probably in a little better position, as the second sand is wonderfully productive and there is every reason to believe that an untouched third sand exists, which should maintain the Long Beach curve for a considerable time.

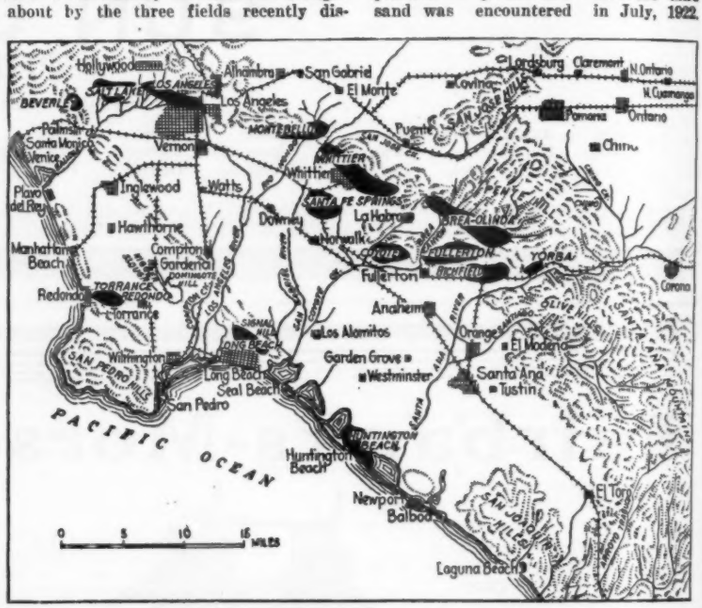
The Redondo Field is new, and little may be predicted for its future; however, a considerable field may be opened up here, thus adding materially to the production of the district.

All the California fields are now past their peak, except the three new ones, and the writers believe that the maximum production of these has almost been reached.

It is possible that the peak of production in the State will be reached during 1923. A rapid decline may not take place at once, for a few more new fields may be discovered, and certainly some of the older fields will be found to have untouched deeper sands; but the rapidity with which new fields are being exhausted under modern methods of intensive drilling, points to the fact that when the new territory has been exploited, the final decline for California will be very rapid instead of gradually declining as have some of our older fields.

New Fields

The record of the four newest fields in California appear in Fig. 4 Huntington Beach. The oldest, did not attain a position of prominence until the third sand was encountered in July, 1922.



The big rich fields of Southern California, with Los Angeles as the center, are shown on this map. Los Angeles County is the largest producer of oil of any county in the United States and there is no territory of like size on earth where there is so much production as that county is showing.

New Methods

The use of rotary drilling equipment has become so universal in the California fields that standard tools are only

used now in the deepening of the wells where the depth and size of casing renders cable tools necessary. The great disadvantage of rotary drilling has always been that no adequate knowledge regarding the formations penetrated reached the surface, which rendered the accurate correlation of well logs practically impossible. This drawback has now been overcome by recently developed methods for taking of core samples. Machines are now in use whereby perfect cores of considerable length may be taken whenever desired.

In addition, the microscopic study of the cores, both as to mineral and fossil content, has progressed to such a point that the loss of a well through mistakes in correlation is becoming rare. By the proper use of these methods the cost of wells may be reduced very materially.

Refineries

During the past year there has been an influx of small refineries, due to the abnormal increase in production of refinable oil in the Southern California fields, together with a considerable increase in the consumption of gasoline. Some of these projects have been started by old-timers in the oil business, familiar with the possibilities and hazards of refining, but a considerable proportion of the new plants are in the hands of promoters or men experimenting with the business. The increase in refinery capacity, however, has not kept pace with the increase in production, so that a large quantity of high-grade oil is going into storage.

It is to be expected that after the flush production is off the Los Angeles basin fields, an adequate supply of refinable oil will be more difficult to obtain, and many of the new companies will fail or will be absorbed by the larger ones. The apparent folly of constructing so many new refineries to care for a temporary increase in production is not as great as it might seem as the progress in refining methods is now so rapid as to render present-day refineries obsolete by the time the dwindling supply of crude renders their abandonment necessary.

The following tabulation shows the capacity of refineries in California as of January 1, 1923:

	Still Capacity Bbls.
Northern California	234,850
*Southern California	208,960
Total	443,810
*New plants in Southern California during 1922 (included in above total)	16,000

*These figures include one experimental plant of 1,000 bbls. capacity.

The new capacity in the above tabulation does not include enlargement of existing plants, data on which are not available. During the past year, several reorganizations took place, resulting in new names, which might be considered under new capacity, except for the fact that the plants were in existence prior to 1922, and are, therefore, included in the totals of the respective areas covered. The districts of Northern and Southern California are here divided by a line extending eastward from Santa Barbara through Tehachapi Pass.

Storage

Because of the phenomenal increase in California production during 1922, early in the year many of the big companies planned to increase their storage capacity which, it was felt, would be taxed to the limit during 1923. Early in 1920, the storage capacity for California was 68,000,000 bbls. By May of 1922, the State Mining Bureau announced that this storage had increased to 78,000,000 bbls. This latter figure is distributed between northern California, having 52,000,000 bbls., and southern California with 26,000,000 bbls. Because of the increase in production from the Los Angeles basin, practically all of the new storage is being built in the southern part of the State. Between May and December 31, 1922, about 6,000,000 bbls. capacity was completed, or nearly so, in the south, and about 1,000,000 in the north, so that at present the State has a capacity of approximately 85,000,000 bbls. The American Petroleum Institute's figure for the oil in storage December 31, 1922, is 61,184,928 bbls., leaving available about 23,000,000 bbls., which, if oil continues to be stored at the present rate, will be filled within the next year.

The storage is divided as follows: (American Petroleum Institute figures.)

Heavy crude, below 20° A. P. I. including residuum at December 31, 1922	40,857,761
Refinable crude, 20° A. P. I. and lighter, including tops at December 31, 1922	20,327,167
Total stocks December 31, 1922	61,184,928

Transportation

No new pipe lines were constructed during 1922, except extensions to some of the new fields. However, there has been much activity in the way of increasing the storage and bunkering facilities at Los Angeles harbor, brought about by the increased exports to the eastern seaboard. It is now considered possible to ship oil from California ports through the Panama Canal to the East, at a lower figure than pipe line charges from the Mid-Continent fields to the same destination. This factor, coupled with the need for immediate disposal of the excess production, has caused the companies to place a large number of tankers in this service.

The export of oil for 1922 is estimated at 30,000,000 bbls., while the contracts for 1923 are in the neighborhood of 50,000,000 bbls. It is hoped that this increase in export will stabilize the California market during the coming year.

Realignment of Companies

The most important realignment of California interests during the past year is that of the Dutch Shell Union of Delaware combination.

The Union of Delaware had acquired the Commonwealth, Western Union, United Consolidated, Dunlap Oil Co., Eddystone and the Columbia Oil Producers, at the time it entered into combination with the Dutch Shell. At the time of the merger, the Shell acquired practically all the stock of the above companies, as well as about one-quarter of the stock of the Union Oil of California and the National Exploration Co.

According to the published statement of the Standard Oil Co. of California, 20 per cent of the stock of the Pacific Oil Corporation was acquired by the Standard during 1922.

There have been many changes among the smaller companies, discussion of which the limited scope of this paper will not permit.

ARGENTINE PRODUCTION AND PETROLEUM IMPORTS

WASHINGTON, D. C., Feb. 24.—The production of crude petroleum by the Argentine National workings at Comodoro Rivadavia during October, 1922, amounted to 30,811 cubic meters (about 194,000 bbls.), as compared with 27,957 cubic meters (about 175,000 bbls.) during September, writes Winfield W. Riefler, clerk to the commercial attache at Buenos Aires, to the United States Department of Commerce. This output was considerably above that for the months of September and October, 1921, which totaled 22,496 and 16,057 cubic meters, respectively.

Imports of crude oil during November totaled 46,202,888 kilos (approximately 330,000 bbls.), a decline of some 2,500,000 kilos from the October figure, according to available statistics. Imports of refined oils also showed a general decline during November as compared with the October figures, lubricating oil receipts of 161,490 gallons being less than half those for October, while kerosene imports fell from 1,640,641 gallons to 1,040,000. November receipts of gasoline and naphtha by Argentina declined some 1,300,000 gallons from those of the previous months, which totaled nearly 3,000,000 gallons.

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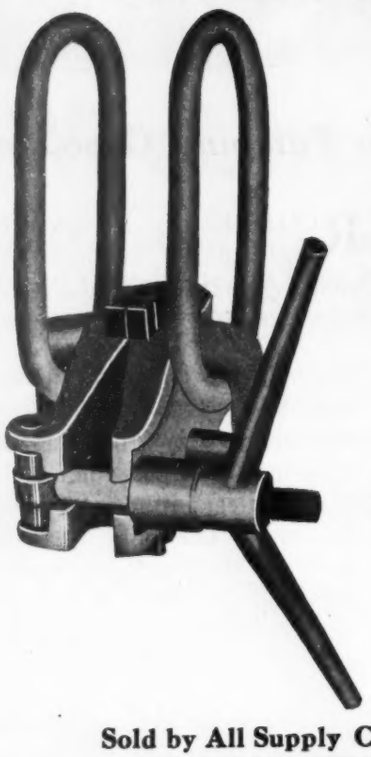

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TIDAL OSAGE OIL COMPANY PAYS DIVIDENDS—WHY?

In this publication last week we gave you what the Marland Refining Company has to say about the LOOP AUTOMATIC SAFETY DEVICE. Below is the result of the Tidal Osage Oil Company's test, and the producer who reads it should have no difficulty in figuring why the Tidal Osage Company pays dividends.

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Tulsa, Oklahoma

Loop Steel Mfg. Co., Ponca City, Okla. Hominy, Oklahoma, Sept. 7, 1922.

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We are pleased to advise you of the result of gauge tests which we have taken on two 250-bbl. steel tanks, set side by side, on our lease, 13-22-8, located near Hominy, Okla.:

Tank No.	Date	Open	Gas Tight
1841	Aug. 31, 1922	7' 8¼"	
1854	"		7' 6¼"
1841	Sept. 1, 1922	7' 7"	
1854	"		7' 6"
1841	Sept. 2, 1922	7' 5¾"	
1854	"		7' 5¾"
1841	Sept. 3, 1922	7' 5"	
1854	"		7' 5¾"
1841	Sept. 4, 1922	7' 4⅝"	
1854	"		7' 5⅝"
1841	Sept. 5, 1922	7' 3¾"	
1854	"		7' 5⅝"
1841	Sept. 6, 1922	7' 3"	
1854	"		7' 5⅝"
1841	Sept. 7, 1922	7' 2½"	
1854	"		7' 5¼"

On Sept. 7 open tank No. 1841 showed gravity of 41 and temperature of 90 degrees and gas-tight tank No. 1854 showed gravity of 44 and temperature of 90 degrees.

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DEVELOPMENT OF GULF COAST FIELD

Alexander Deussen Presents Very Interesting and Valuable Data on the Texas-Louisiana Coastal Country and Its Petroliferous Peculiarities, Geological Features and Drilling Methods.

Alexander Deussen of Houston, Tex., read the following paper before the recent meeting of the American Institute of Mining and Metallurgical Engineers in New York on the subject of "Oil Development in the Gulf Coast Fields During 1922 and Its Significance."

The territory embraced in this survey is the district known as the Gulf Coast, confined to that portion of the coastal plain of Texas and Louisiana, limited on the interior by a line paralleling the Gulf Coast, and distant from it approximately 40 miles, and bounded by Guadalupe River on the west and the Mississippi River on the east. It is the territory in which production is mostly obtained from the well-known salt-dome structures.

There are about 62 known salt domes in the States of Texas and Louisiana, the only part of the United States in which they are found. Of these 62 domes, 40 are located along the Texas and Louisiana coast. Of the 40 domes along the coast, 21 have produced oil in commercial quantity, the most prolific dome, Humble, having produced 90,339,732 bbls. to the end of 1922.

In 1922, production was obtained from the following localities in the area under consideration:

	Bbls.
Barber Hill	336,185
Richmond	1,310
Batson	429,393
High Island	620
Blue Ridge	415,562
Damon Mound	1,035,410
North Dayton	108,925
Goose Creek	5,248,064
Hull	6,818,236
Humble	2,552,940
Markham	34,730
Orange	5,505,977
Pierce Junction	1,149,225
Saratoga	661,868
Sour Lake	1,737,682
Spindletop	295,013
West Columbia	11,631,747
Anse La Butte	35,552
Jennings	136,879
Edgerley	116,358
Vinton	1,436,700
Total	39,588,976

Discovery of Domes

The following two tables will afford some interesting data in regard to the rate at which new domes and new fields have been discovered in the Gulf Coast district:

Year	Local. Prod.	Discov. New Fields	Discov. New Domes	Discov. New Sands Old Fields
1901	3	3	15	0
1902	6	3	7	0
1903	7	1	3	0
1904	8	1	3	0
1905	9	1	0	0
1906	9	0	1	0
1907	9	0	0	0
1908	11	2	2	0
1909	11	0	0	0
1910	12	1	0	0
1911	12	0	1	0
1912	13	0	1	0
1913	14	2	4	0
1914	14	0	0	*2
1915	14	0	0	0
1916	14	0	0	0
1917	17	3	2	†1
1918	18	1	0	0
1919	20	2	0	0
1920	20	0	0	0
1921	21	1	0	‡1
1922	21	1	1	0
Total			40	

*Sour Lake, Humble. †Goose Creek. ‡Orange.

Year	Field—	No.
1901	Spindletop, Jennings, Sour Lake	3
1902	Anse La Butte, Welsh, Saratoga	3
1903	Batson	1
1904	Humble	1
1905	North Dayton	1
1908	Goose Creek, Markham	2
1910	Vinton	1
1913	Edgerly, Orange	2
1917	New Iberia, Damon Mound, West Columbia	3
1918	Hull	1
1919	Barber Hill, Blue Ridge	2
1921	Pierce Junction Orange (deep sands)	1
1922	Big Creek	1
Total		22

There are oil producing localities in the Gulf Coast, including Goose Creek, Orange, Edgerly and Welsh, which are not definitely known to be associated with salt dome structures, although it has been found that the oil producing sands in these localities are slightly arched into gentle domes, but the typical cap rock with the underlying salt core has not been penetrated in any of the wells drilled at these places. However, for the purpose of this report, they are considered to be structures in which the salt lies at great depth below the producing sands, the salt not yet having been reached in the wells.

Production Record

Production of the Gulf Coast fields, including the localities above listed, during the year 1922 was 39,588,976 bbls. The production for 1922 was the greatest in the history of the Gulf Coast, exceeding by 13,261 bbls. the production of 1921, and by 817,733 bbls. the production of 1905, the next greatest yearly record. The production of 1922 was secured from 22 fields, as compared with nine producing fields in 1905. The 1905 production represents, in part, the large flush production secured from the cap rock in the Humble Field, discovered in the early part of 1905.

The total production by years of the several fields in the Gulf Coast district is indicated in the following table:

Year	Barrels	Year	Barrels
1901	3,593,113	1912	8,230,614
1902	18,013,904	1913	8,640,974
1903	16,369,353	1914	13,116,248
1904	24,633,069	1915	20,531,020
1905	38,771,243	1916	21,794,972
1906	30,827,126	1917	24,111,634
1907	16,401,400	1918	24,111,021
1908	15,740,952	1919	27,347,397
1909	10,796,264	1920	32,557,775
1910	19,497,906	1921	39,575,715
1911	22,174,735	1922	39,588,976
Total			468,254,396

New Territory Opened

The outstanding features in Gulf Coast operations during the 1922 development, were the discovery of a new salt dome in Fort Bend County, Texas, south of Richmond; the development of Orange to a field of large production, and the extension of the productive area at Hull to the north and west sides. Of these three developments, probably the discovery of the new dome, known as Big Creek Dome, in Fort Bend County, is the most significant.

It will be noted from the table above that prior to 1922 no new domes had been discovered in the Gulf Coast since 1917, in which year two additional domes were discovered, these two domes being the first discoveries since 1913. In other words, since 1913, the wildcatting and prospecting in the Gulf Coast district has resulted only in the discovery of new salt domes, notwithstanding that in this interval probably as many as 1,000 wildcat areas were tested.

There was little in the way of surface indications to point to the existence of a salt dome in the vicinity of the Big Creek dome. There is no topographic feature in evidence, the only thing attracting attention to the locality being some faint gas seepages and sulphur water in the springs along the creek at this point.

The first test by the Gulf Production Co., completed on April 20, 1922, succeeded in proving the dome. The well entered cap rock at 600 feet, and rock salt at 715 feet, drilling into the salt at a depth of 765 feet. This well made a small producer obtaining production from the cap rock, the initial production being estimated around 250 bbls.

Additional development during the year has succeeded in outlining the limits of the dome to the northwest and southeast, but its extent in a northeast-southwest direction has not been determined from the development.

The Gulf Production Co.'s No. 2

Wheat, located about 1,000 feet, a little south of west from Gulf Co.'s No. 1 Wheat, entered the cap rock at 512 feet, without making a producer. Gulf Production Co.'s No. 1 Davis, located about 1,500 feet, a little north of west from the discovery well, likewise entered the cap rock at a depth around 600 feet.

Limits Not Defined

Gulf Production Co.'s No. 2 Davis, located about 2,500 feet northwest from the discovery well, proved to be off the dome, this test drilling to a depth of approximately 3,800 feet without striking any dome materials such as cap rock or salt, and failing to establish production, although a number of encouraging oil showings were found. Later in the year a number of tests were started on the southeast side of the dome determining its limits and possibilities in this direction.

Brooks No. 1 located about 750 feet southeast from the discovery well entered the cap rock at 500 feet, but secured no production.

Poor Boy's No. 1, located on the Ahlers lease about 1,000 feet southeast from the discovery well and about 250 feet southeast from the Brooks well, proved to be off the dome, defining the limit of the cap rock on this part of the dome, between this well and the Brooks well, and showing a very steep dip of the salt surface on this side of the dome. The Poor Boy well succeeded in establishing small production in some of the lateral sands adjacent to the dome below the cap-rock level, this well producing at the present time something like 200 bbls. per day from a sand at a depth of about 1,700 feet.

The Gulf's No. 3 Wheat, located about 300 feet southeast from the Poor Boy well, at the present time drilling around 3,800 feet, has just entered a sand which is showing for a well. The outcome of the test remains to be determined.

The only additional well drilled on this dome is one by McLeod and others, on the Moore and others' tract about 2,000 feet south-southeast from the discovery well. This well is standing at 1,600 feet, and has not reached sufficient depth to determine the oil possibilities in the deeper sands on this side of the dome.

Summarizing the results of the Big Creek development, it may be stated that this seems to be a small dome, its diameter along a northwest to southeast course not exceeding 5,000 feet; its northeast to southwest diameter may be somewhat longer. The salt core is on top, about 165 feet thick at the point capped by a cap rock more or less flat of the initial discovery well. The high point of the cap rock, so far as present development indicates, is at the place where the Gulf Production Co.'s No. 2 Wheat was drilled, where it lies 512 feet below the surface. The cap rock does not appear to contain a large quantity of oil, though the discovery well yields oil of 23 degree gravity, which is the normal oil of the Gulf Coast domes.

Steep dips of the salt surface characterize this dome on the southeast and northwest. It appears from the wells of the Poor Boy Oil Co. and Gulf Production Co.'s No. 3 Wheat, that there is oil accumulation in the lateral sands on this side of the dome between the 1,700 and 4,000-foot levels, this oil likewise being 23 degree gravity and normal salt-dome oil.

While it is impossible to forecast the future for this locality, it is believed that the area will develop into a commercial oil field similar to the other producing domes of the Gulf Coast district.

Developments at Orange

Next to the Big Creek discovery, the developments at Orange during the year are an outstanding feature in Gulf Coast operations for 1922. The first producing well in the present Orange district was completed in August, 1913, and has been pumping continuously since that time, having produced over 100,000 bbls. of oil.

Up to a few weeks ago, it has been impossible to establish any additional production immediately surrounding this well, though a half dozen tests or more have been drilled in this immediate vicinity. The area of present production is from ¾ to 1 mile removed from the original discovery well in this field. Production in the present main field was first established in March, 1920, when the Little Six Oil Co. completed its No. 1 Chesson as a 50-bbl. pumper at 1,760 feet. This test stimulated additional drilling in this portion of the field, with the result that, by the end of 1921, there were 13 wells producing in the present main area of production, disregarding the one well in the Bland district.

Interest in the Orange Field reached a climax with the completion of the Humble Co.'s No. 5 Chesson as a 14,000-bbl. well at a depth around 3,900 feet, about December 28, 1921. The discovery of this unusually large volume from the deepest horizon up to that time proved for the Orange Field, resulted in an increased interest in the district, and a larger and more acitve drilling campaign, which is still under way.

In the interval that prospecting has been in progress in the Orange district, there were drilled, up to October 1, 1922, 187 wells. Of these 60, or (31.8 per cent) were dry holes and 127 or (68.2 per cent) were oil wells. There were 33 wells drilling in the field on October 1, 1922. Disregarding the Bland district, the site of the original discovery, and taking into consideration only the present productive area, there were drilled here, up to October 1, 1922, 159 wells of which 23 (14.4 per cent) were dry and 136 or (85.6 per cent) were oil wells.

The results of the year's drilling operations are reflected in the production of the field, this production having increased from 704,870 bbls. in 1921 to 5,505,977 bbls. in 1922.

Production of Orange

The yearly production of the Orange Field has been as follows:

Year	Bbls.
1913	17,706
1914	43,208
1915	21,697
1916	17,758
1917	7,023
1918	3,425
1919	*4,400
1920	4,000
1921	704,870
1922	5,505,977
Total	6,330,064

*Estimated.

Oil is obtained at the following levels. The figures of the number of producing wells are up to October 1, 1922:

No.	Depth	Wells	Initial Prod.
1	1751-1760	1	50
2	2000-2175	2	90
3	2600-2750	1	150
4	2800-2975	3	483
5	3000-3175	17	954
6	3200-3375	34	854
7	3400-3575	18	1,305
8	3600-3775	6	2,052
9	3800-3950	8	4,535
10	4000-4100	11	1,541
11	4200-4300	9	1,772

The producing sands are Pliocene and Miocene. The lowest sand, or the 4,200-4,300-foot sand, is probably not older than Miocene. So far as can be determined at this time, it appears probable that the Orange Field is a local uplift in a broad synclinal depression. The beds of the main productive area lie very flat with a faint suggestion of slight doming, the high point being probably in the vicinity of the Humble Co.'s Chesson No. 5. As has been indicated, no typical dome formations, such as cap rock or salt, have been found in the Orange Field to date.

In the development, water has given much trouble. Wells have come in making a good flow of oil only to be shortly drowned out by water. These facts seem to indicate that the water sands are intermingled with the oil sands, and that in the case of some sands only the upper portions are saturated with oil, the lower portions containing water. Numerous blowouts, and unusual gas pressures have characterized the field's development, these phenomena likewise being highly spotted. In the case of the larger wells giving large initial production, the sanding up of wells has been the rule, much

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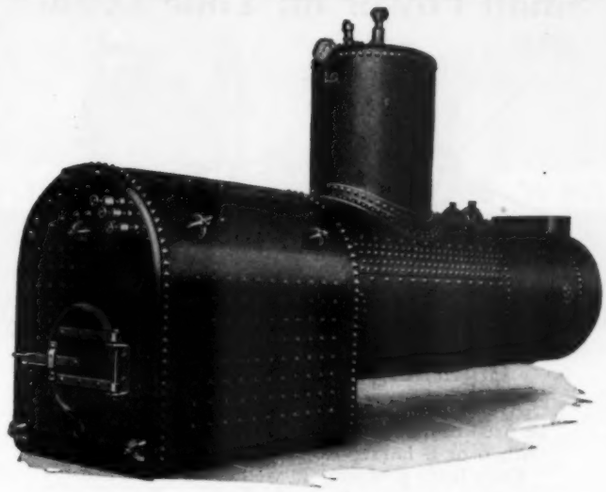

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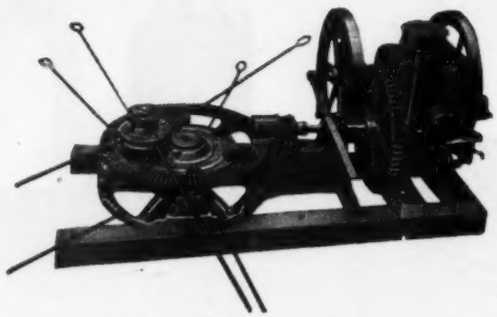

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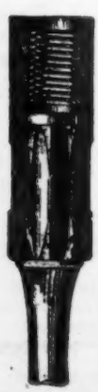

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fine sand difficult to screen occurring in various parts of the field and at different levels. Because of these various factors, long-lived wells have been the exception in this field, and much re-drilling and re-working of wells has been required.

Developments at Hull

Next in point of importance was the extension of the deep-sand production to the northwest and west sides of Hull. Production had previously been limited to the south, southeast and northeast sides of the dome.

In May, 1922, the Yount-Lee Oil Co. succeeded in completing a 6,000-bbl. well at a depth of 3,244 feet on its Merchant lease, proving the productive capacity of the lateral sands on this side of the dome. Since that time, 19 wells have been completed on this side, giving large initial productions, the most remarkable being the Yount-Lee Oil Co.'s Merchant No. 5, completed on January 3, 1923, for a 6,500-bbl. well at a depth of 3,770 feet. This well subsequently increased its production to 12,000 bbls. of pipe line oil, at which rate it continued to produce for 10 or more days.

Production was proved on the west side of Hull, the Republic Production Co. completing its No. 3 Hannah as a 200-bbl. well in a sand at 1,870-1,915 feet about August 4, 1922. Since that time, there have been completed in this part of the field 24 other wells. The unusual feature of this production is the comparatively shallow depth at which it is obtained, namely 1,200-2,000 feet.

The present daily production of Hull is 35,690 bbls., and the record of the field's production since the date of its discovery is:

Year	Bbls.
1918	330,300
1919	1,476,405
1920	4,568,682
1921	8,717,970
1922	6,818,236
Total	21,911,593

An unusual feature in regard to the development at Hull has been the extension of the production to practically all sides of the dome, this being the first instance of this kind in Gulf Coast development.

Geological Features

The year's development in the Gulf Coast operations has not yielded anything startling in the way of new geological information, but has served to confirm previous geological conceptions concerning the domes. Studies on well cuttings during the year seem to establish with more definiteness the age of the oil-producing sands around the domes. It is found that these sands are mainly of Miocene or Oligocene age. In some instances, as in the case of some of the upper sands at Orange, the production appears to be in sands of Pliocene age, and some of the very deep production around a few of the domes may belong to the Jackson, but this is not proved. The deep production at Humble is mainly from sands of Oligocene age.

The Jackson formation has been found at a very shallow depth on the west side of Hull, about 700 or 800 feet, its normal position in this latitude being approximately 5,000 feet below the surface, the uplift of this formation here being about 4,300 feet. The Jackson formation has been entered at a depth of approximately 4,000 feet in some of the wells drilling on the southwest side of the Hockley dome.

The so-called black shale and heaving shale are materials characteristic of the coastal salt domes. The black shale is a compact dark mucky shale, generally saturated with light oil, usually found beneath the oil-producing sands and directly on top of the salt. It is found in most of the domes where production is obtained, being very common at Humble, Vinton and Hull. It has not been found in such fields as Goose Creek and Orange. This material seems to be the source from which the oil found in the present producing sands is derived, and its peculiar nature is probably due to the squeezing effect produced by the in-

(Continued on page 112)

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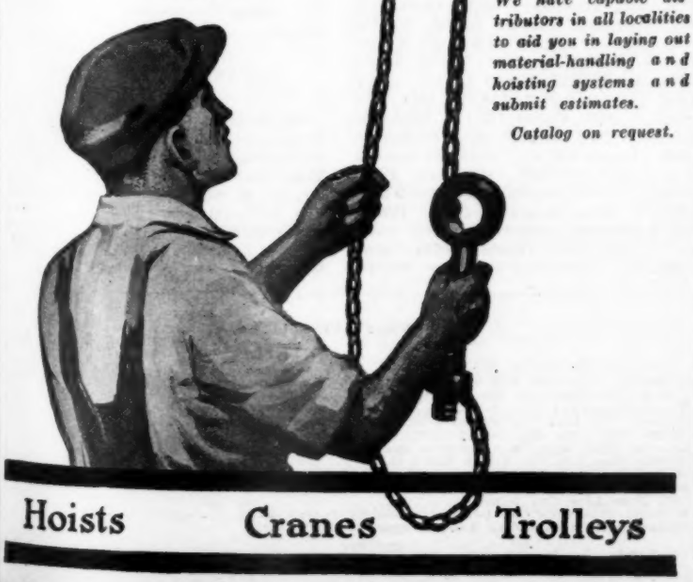

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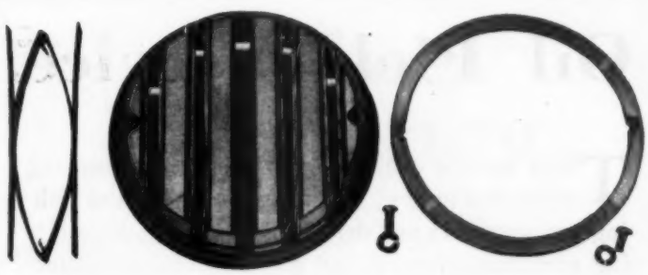

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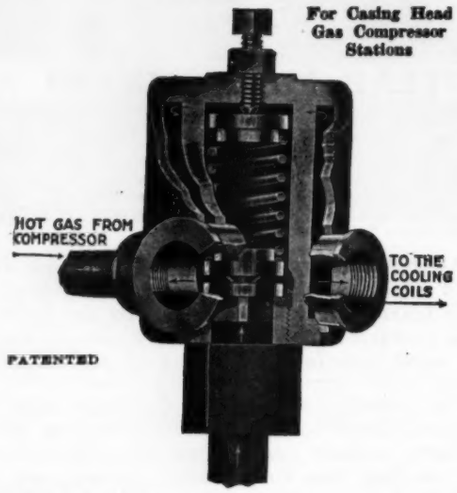

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PRODUCING RECORD OF A GREAT FIELD

(Continued from page 16)

Sinclair Oil & Gas Co., northeast quarter 1-26-5, 470,750 bbls., May, 1921; Laurel Oil & Gas Co., northwest quarter 1-26-5, 422,039 bbls., May, 1921; Marland and others, southeast quarter 1-26-5, 694,928 bbls., January, 1921; Clint Moore and others, southwest quarter 1-26-5, 172,946 bbls., February, 1922; Comar Oil Co., northeast quarter 2-26-5, 11,519 bbls., November, 1922; Marland Oil Co. and others, northeast quarter 12-26-5, 32,880 bbls., September, 1922; Gypsy Oil Co., southeast quarter 24-27-5, 665,972 bbls., September, 1922; Phillips-Skelly Oil Co., southwest quarter 24-27-5, 453,492 bbls., October, 1922; same interests, northeast quarter 25-27-7, 352,540 bbls., June, 1922; same interests, northwest quarter 25-27-5, 347,202 bbls., June, 1922; same interests, southeast quarter 25-27-5, 651,362 bbls., August, 1921; same interests, southwest quarter 25-27-5, 376,793 bbls., February, 1922; same interests, southeast quarter 26-27-5, 13,957 bbls., November, 1922; same interests, northeast quarter 35-27-5, 4,960 bbls., November, 1922; same interests, southeast quarter 35-27-5, 68,936 bbls., October, 1922; Twin State Oil & Gas Co., northwest quarter 36-27-5, 60,564 bbls., February, 1921; Marland and others, southeast quarter 36-27-5, 469,528 bbls., December, 1920; Sinclair Oil & Gas Co., southwest quarter 36-27-5, 737,668 bbls., October, 1921; Kewanee Oil & Gas Co., northeast quarter 4-26-6, 224,230 bbls., March, 1922; Prairie Oil & Gas Co., northwest quarter 4-26-6, 799,573 bbls., October, 1921; Tidal-Osage Oil Co., southeast quarter 4-26-6, 285,258 bbls., October, 1921; Roxana Petroleum Corporation, southwest quarter 4-26-6, 833,664 bbls., February, 1921; Moore and others, northeast quarter 5-26-6, 882,798 bbls., April, 1921; Gypsy Oil Co., northwest quarter 5-26-6, 656,806 bbls., May, 1921; Carter Oil Co., southeast quarter 5-26-6, 868,207 bbls., February, 1921; Devonian Oil Co., southwest quarter 5-26-6, 608,512 bbls., April, 1921; Cosden Oil & Gas Co., northeast quarter 6-26-6, 375,889 bbls., November, 1921; Marland and others, northwest quarter 6-26-6, 266,808 bbls., April, 1921; Friedman and others, southeast quarter 6-26-6, 197,771 bbls., February, 1922; Marland and others, southwest quarter 6-26-6, 227,950 bbls., February, 1921; Phillips-Skelly interests, northeast quarter 7-26-6, 82,916 bbls., May, 1922; Gypsy Oil Co., northwest quarter 7-26-6, 65,975 bbls., August, 1922; Kewanee Oil & Gas Co., southeast quarter 7-26-6, 2,603 bbls., November, 1922; Carter Oil Co., northeast quarter 8-26-6, 282,649 bbls., November, 1921; Cosden Oil & Gas Co., northwest quarter 8-26-6, 199,978 bbls., December, 1921; Carter Oil Co., southeast quarter 8-26-6, 308,104 bbls., March, 1922; Cosden Oil & Gas Co., southwest quarter 8-26-6, 65,657 bbls., April, 1922; Carter Oil Co., northeast quarter 9-26-6, 278,521 bbls., November, 1920; Carter Oil Co., northwest quarter 9-26-6, 353,465 bbls., September, 1920; Carter Oil Co., southeast quarter 9-26-6, 388,644 bbls., February, 1921; Carter Oil Co., southwest quarter 9-26-6, 599,108 bbls., January, 1921; Prairie Oil & Gas Co., northwest quarter 10-26-6, 187,355 bbls., October, 1921; same company, southwest quarter 10-26-6, 107,992 bbls., December, 1921; Midland Oil Co., northwest quarter 15-26-6, 44,320 barrels, May, 1922; Marland Oil Co. and others, northeast quarter 16-26-6, 93,961 bbls., January, 1922; Carter Oil Co., northwest quarter 16-26-6, 244,839 bbls., December, 1920; Cosden Oil & Gas Co., northeast quarter 17-26-6, 101,550 bbls., May, 1922; Gypsy Oil Co., southeast quarter 19-27-6, 691,908 bbls., September, 1922; Phillips-Skelly interests, southwest quarter 19-27-6, 447,548 bbls., September, 1922; Gypsy Oil Co., northwest quarter 28-27-6, 181 bbls., December, 1922; Gypsy Oil Co., southeast quarter 28-27-6, 2,168 bbls., August, 1922; same company, southwest quarter 28-27-6, 142,311 bbls., June, 1922; Phillips-Skelly interests, northeast quarter 29-27-6, 227,124 bbls., September, 1922; Gypsy Oil Co., northwest quarter 29-27-6, 399,082 bbls., September, 1922; Sinclair Oil & Gas Co., southeast quarter 29-27-6, 535,282 bbls., June, 1922; same company, southwest quarter 29-27-6, 633,083 bbls., March, 1922; Prairie Oil & Gas Co., northeast quarter 30-27-6, 627,628 bbls., March, 1922; Phillips-Skelly interests, northwest quarter 30-27-6, 522,946 bbls., April, 1922; Prairie Oil & Gas Co., southeast quarter 30-27-6, 501,031 bbls., December, 1921; Marand and others, southwest quarter 30-27-6, 661,212 bbs., August, 1921; Carter Oil Co., southeast quarter 31-27-6, 577,659 bbls., February, 1921; Carter Oil Co., southwest quarter 31-27-6, 492,307 bbls., March, 1921; Sinclair Oil & Gas Co., northeast quarter 32-27-6, 744,566 bbls., March, 1922; Gypsy Oil Co., northwest quarter 32-27-6, 598,734 bbls., January, 1922; Gypsy Oil Co., southwest quarter 32-27-6, 655,511 bbls., October, 1921; Carter Oil Co., northeast quarter 33-27-6, 1,487 bbls., August, 1922; Sinclair Oil & Gas Co., northwest quarter 32-27-6, 319,958 bbls., June, 1922; Waite Phillips Co., southeast quarter 33-27-6, 60,186 bbls., April, 1922; Prairie Oil & Gas Co., southwest 33-27-6, 488,937 bbls., April, 1922.

DRILLING IN GREECE

WASHINGTON, D. C., Feb. 24.—A consular report to the United States Department of Commerce from Patras, Greece, says all Epirus, the western coast of the Peloponnesus, and the Ionian Islands, except Zante, have been conceded to a French company for two and a half years for research work; and half of the expenses, not to exceed 500,000 drachmans, are to be defrayed by the Greek Government. The company is now drilling in Epirus, where it is stated that a small quantity of oil has been found. A well on the Island of Zante has produced from two to three tons of petroleum, rich in asphalt but otherwise of poor quality. As the well has never been properly worked it is impossible to estimate the possible output.

JAPANESE PRODUCTION

WASHINGTON, D. C., Feb. 24.—The Department of Commerce learns from Commercial Attache James F. Abbott at Tokyo that the production of oil in Japan for the 10 months ended October, 1922, was 1,559,406 bbls. These figures show a loss when compared with the total for the first 10 months of 1921, namely 1,838,621 bbls.

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Company and size of line—	Estimated Capacity Bbls.	Av. Runs Week Feb. 27 Bbls.
Oklahoma Pipe Line Co., 6-inch	12,000	6,433
Prairie Pipe Line Co., two 6-inch	25,000	8,334
Kay County Gas Co., 6-inch	9,000	4,937
Sinclair Pipe Line Co., looped 6-inch	14,000	5,261
Osage Pipe Line Co., 4-inch	4,500	1,629
Standish Pipe Line Co. (gathering system for Phillips Pet. storage)	.....	3,079
Cosden Pipe Line Co., 6-inch and 4-inch	17,000	14,545
Moore Refining Co., 3-inch	3,000	737
Empire Pipe Line Co., 4-inch	4,500	4,500
Gulf Pipe Line Co., 8-inch	20,000	19,343
Burbank Pipe Line Co., 4-inch (to loading racks)	4,000	.....
Magnolia Petroleum Co., 8-inch (under construction)	18,000	(const.)
Total	131,000	75,845

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Each and every one of our Balls and Seats are perfect in material and workmanship. You won't have to look over a dozen to find a good one. They are ALL PERFECT. It is even unnecessary to inspect a NO-CO-RO Ball and Seat before putting same in the well. They are thoroughly INSPECTED THREE TIMES during the process of manufacturing and grinding in, by the latest and most approved tools and appliances and each and every Seat is guaranteed ABSOLUTELY PERFECT and to give MANY TIMES the service of any other make of Ball and Seat.

You to be the judge of services obtained. We have never fallen down on our guarantee and we never will

Manufactured Only by

NORRIS BROS., Inc.
Robinson, Illinois. U. S. A.

THE SUNBURST OIL FIELD OF MONTANA

(Continued from page 11)

prises 23,040 acres; with 8 acres per well; this means room for 2,880 wells. If these wells average 30,000 bbls. apiece, there are 86,400,000 bbls. of recoverable oil.

Discussion of Dry Holes

Dry holes in the field fall into three classes: Those dry holes naturally expected on the edge of every structure; dry holes caused by the lenticular nature of sands; dry holes caused by difference in porosity as a result of cementation, or lack of it, in the oil horizon.

The dry holes found in the first class limit the field and are: The Sunburst Boyce in Section 23-36-2w; the Maley well in Section 31-36-1w; the Rainbow well in Section 7-35-3w; the California Wilson well in Section 10-35-3w. The Montana-Sweetgrass test well in Section 1-32-1w is dry at 1,577 feet. This well showed no oil, gas, nor water in the Kootenai horizon and an absence of sand in the Ellis. It is more likely to go in the second class but at present is a boundary well; these wells definitely mark productive bounds in both the Kootenai and in the Ellis horizons.

Dry holes in the second class are the Fulton well in Section 1-34-3w, and the Sunburst-Suhr well in Section 10-34-2w. These wells showed from 1 to 2 feet of sand in the Ellis, but not enough oil to pay. The Sunburst producing sand, in the southern part of the area, is entirely absent. The Berg gas horizon, Section 6-32-1w, is a new horizon in the Kootenai.

Dry holes in the third class are the Ohio-Reibe No. 1 in Section 3-35-2w; the Shaffer well in Section 33-36-2w; the Hollingsworth well in Section 34-34-2w; these wells may be greatly benefited by shooting. Two wells, the Homestake-Reibe in Section 3-35-2w, and the Thornton No. 2, in Section 17-35-2w, were classed as dry holes, until shot with 100 and 80-quart charges, respectively. Other wells of similar type will be shot into production in the future.

Quality of Crude Oil

An analysis of Sunburst crude taken from the Davey No. 1, the discovery well in the Kootenai sand, is given as the result of a straight distillation test by a local refinery:

Gravity—36.3° Be.
Gasoline—26.0 per cent, 58.6° Be., end point 428° F., initial boiling point 102° F.
Engine distillate—6.0 per cent.
Kerosene—15.0 per cent, 42° Be., flash point 150° F., fire test 170° F.
Gas oil—10.0 per cent.
Fuel residue—43.0 per cent.

This gasoline percentage can be increased 10 per cent by better refining methods.

The Ellis crude ranges from 29 degrees to 38 degrees Be. gravity. Local refiners say that it has furnished as high as 37.5 per cent gasoline and 23 per cent of kerosene. This oil runs 0.5 to 1.5 per cent sulphur, giving it a peculiar odor. The oil can be refined and gives results comparable to the Salt Creek crude. A complete analysis is not available at present.

Gas Wells

Nearly all the wells drilled have gas enough to furnish one or more drilling wells. Four gas wells that have been completed show from 1,500,000 to 7,500,000 feet of gas per day, all from the Kootenai horizon. These are the Lewis well, the Barr well in Section 2-35-2w, the Sindon well in Section 1-35-2w, and the Berg well in Section 6-33-1w. The Lewis and Sindon wells are good for 1,500,000 feet of gas, each, the Barr for 2,000,000, and the Berg for 7,500,000 feet. The gas from the Berg well is being piped to Shelby for commercial purposes. If enough good wells of the same type are completed, a gas line will be built to Great Falls, where the city and smelters can consume 15,000,000 feet per day, making a gas field a profitable venture.

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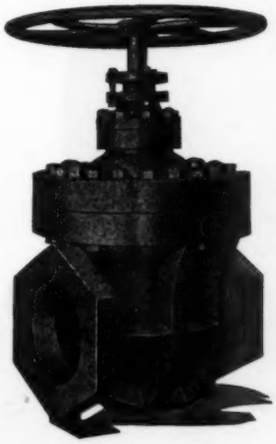

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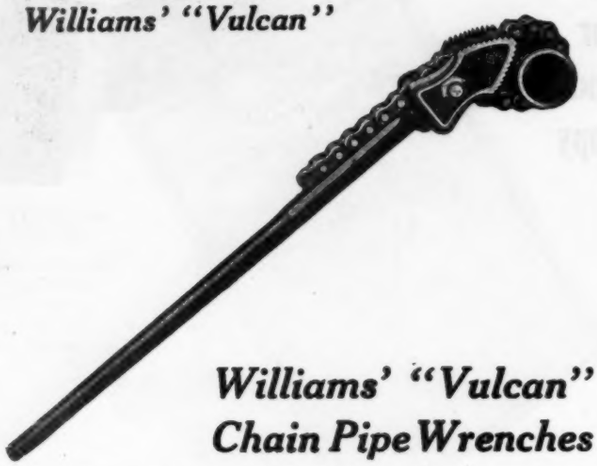

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Each "Vulcan" flat link chain is individually proof tested in a standard tension machine to two-thirds of its catalog breaking strain.

Williams' Wrenches are the only pipe wrenches that offer this proved strength and security.

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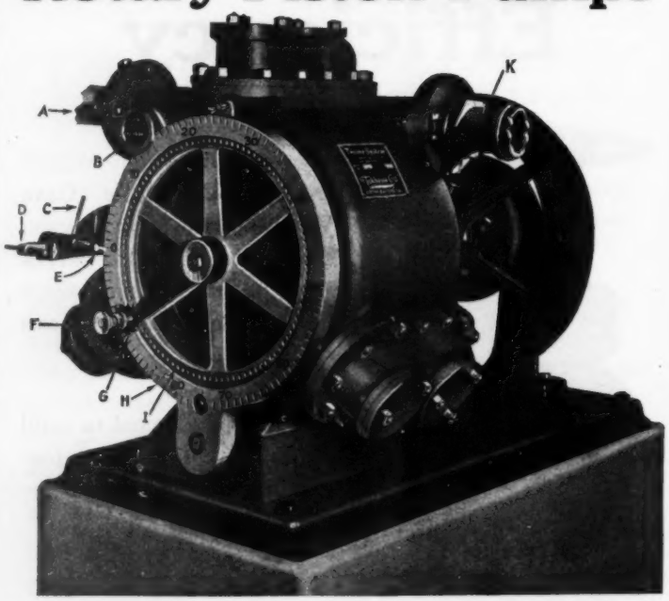

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Double-serve filling station pumps.

Automatic stop at any predetermined quantity from one gallon to 11,000 with totalizing register. Write for Bulletin "O."

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Casing-Head Gasoline

The gas in this field can be utilized for casinghead gasoline. The Ohio-Berg well is reported to give 0.70 gal. per 1,000 feet, with a volume of 7,500,000 feet per day. Other wells in the field show from 1 to 4 gal. per 1,000 feet, so that as further operations take place, the natural gasoline business will develop.

General Stratigraphy

The main formations encountered in this field are noted in the geologic column here given. The first two formations are found on the sides of the field and are unimportant, so far as drilling is concerned. However, they occur on the outside of the structure and are useful in delineating general structural features of a regional nature.

Geologic Column

Two Medicine, 500+ Massive sandstones and shales.

Eagle sandstone, 200. Massive sandstone that forms the escarpment west, north, and east of field; not found on top of dome.

Colorado shale, 1,750. Shales at top; sands at base furnish sufficient gas in places for drilling operations; basal sands possible producing horizons.

Kootenai beds, 450. Green, red, and white shales; pepper and salt sands; carry oil and gas in commercial quantities.

Ellis, 300. Thickness in various places over field varies due to unconformity; black shales; siliceous limestone at base; most consistent oil horizon of field.

Madison limestone, 800. Massive limestone carrying showings of oil throughout.

Devonian, 375. Limestone and black shale, carries showings of oil in Troy-Sweetgrass test; possible producing formation.

Silurian, 50. Anyhydrite beds.

Origin of Oil

There are many theories regarding the origin of oil in Montana and Wyoming. It is the opinion of the author that the oil in the Kootenai beds and in the Ellis in northern Montana is indigenous, or native, to those formations. There is plenty of organic material in the basal Kootenai shales, from which oil might have been derived, even though those beds are of brackish and fresh-water origin. Also, the Ellis beds consist of marine shales, black in color at the outcrop and carrying many fossils. If oil came from the Colorado shales, as has been suggested, it has so far failed to saturate the basal Colorado shales, which do, however, carry a little oil in parts of the field, and furnish gas wells sufficient for drilling purposes. The main oil production is, however, 300 to 600 feet below the Colorado beds. The Madison limestone is considered, by some geologists, as the source of oil, but there is no need to look beyond the Kootenai and the Ellis beds for material from which oil might be derived. The nature of the building of marine limestone, such as the Madison, seems to preclude them from being the source of oil, although the possibility is granted.

Typical Log in Sunburst Field

Depth	Character of Formation
0- 60	Blue shale
60- 280	Light blue shale
280- 285	Gray shale
285- 370	Light blue shale
370- 400	Black sandy shale (Showing gas at 400 feet)
400- 470	Light blue shale
470- 480	Sandy blue shale
480- 520	Light blue shale
520- 700	Sandy gray shale
700- 740	Gray sand
740- 750	Gray shale
750- 780	Yellow shale
780- 810	Blue shale
810- 825	Sandy gray shale
825- 965	Blue shale
965- 995	Sand carrying some water
995-1020	Dark gray shale
1020-1040	Blue shale
1040-1050	Gray sand
1050-1075	Blue shale
1075-1085	Light gray shale showing gas
1085-1105	Sand carrying gas
1105-1125	Blue shale
1125-1150	Sand carrying gas
1150-1200	Top Kootenai
1200-1215	Gray sandy shale
1215-1240	Red shale
1240-1390	Gray sandy shale
1390-1418	Gray shale
1418-1425	Reddish shale
1425-1450	Red shale
1450-1460	Gray shale
1460-1470	Sand
1470-1485	Gray shale
1485-1500	Red shale
1500-1535	Gray shale
1535-1545	Sand carrying gas and oil
1545-1550	Good flow of oil
1550-1565	Oil sand (Kootenai oil horizon)
1565-1580	Black shale
1580-1590	Broken sand
1590-1650	Black shale, top Ellis formation
1650-1680	Limey shale
1680-1760	Dark limey shale
1760-1765	Lime shell
1765-1775	Dark sandy limestone (Ellis oil horizon)
1775-1780	White limestone (Madison)

Geological Structure

The regional features of this area are very interesting. The Sunburst oil field is situated on top of a gigantic dome, which in turn is superimposed upon the axis of the great Sweetgrass arch. This Sweetgrass arch is a structural feature comparable in size to the Cincinnati arch of Ohio and Kentucky, to the Bend arch of Texas, and to the buried granite core of central Kansas. The arch is a northward plunging fold that starts 50 miles south of Great Falls and extends northward into Canada for 100 miles. The average northward plunge from Great Falls to the Canadian line is 16 feet per mile. The western limit of this fold is 60 miles west of the axis in the basin just east of the Rocky Mountains. The eastern limit of the arch, near the Sunburst Oil Field, is the syncline 12 miles east of the axis. This syncline changes strike and swings east rapidly. The Sweetgrass Hills, three large masses of igneous rocks, rising above the plain have played a minor part in the formation of the arch, as the hills are east of the syncline.

The oil production is found on a great dome superimposed on the main arch. The highest part of this dome is in or near Sections 28, 29, 32, 33 and 34-34-1w, and Sections 4 and 5-33-1w. The water level on the north lies 600 feet down from the dome, as shown by the water levels in the Maley well in Section 31-36-1w, and in the Boyce well, Section 23-36-2w. If this same governing contour, the 1,650, extends around this field, the possible productive area would include 212 square miles. General structural conditions are important but local conditions, such as lensing and porosity, seem to govern the accumulation of oil into commercial pools on the main structure. A discussion of the dry holes in the field gives some index as to what may be expected in the way of changes from place to place.

The dips on this fold are low; 1 to 2 degrees is a high dip. The average dip is 50 feet per mile although local changes may run as high as 180 feet per mile. The Sunburst Dome is the first example of a fold of such low dips producing in the Rocky Mountain area. The low dips were given by many geologists as one of the main reasons for condemning this area when drilling was first begun.

Production Range on Contours

So far, no wells have produced oil below the 1,650-foot contour, which to date must be set as the limiting contour of the field. The highest contour is 2,250 feet, so the productive range will, in all probability, be over a contour range of 600 feet, and covering five full townships, or 212 square miles. It is not thought possible for all this large area to produce, but a large part of it may be expected to give commercial production.

Collier, in his preliminary report of July, 1922, fails to mention the work of Jamieson and Howard, and other geologists, which is, no doubt, an oversight. He bases his contour map on the top of the Madison limestone. On the whole this map summarizes conditions fairly well. It embodies information gained from a number of sources and after more careful, detailed work had been undertaken by a number of companies. However, there are a number of differences, especially in the extreme southern and eastern ends of the field, as shown definitely by wells drilled since Collier's work was completed. His work was, however, an excellent guide to conditions in the southern part of the field.

Economic Conditions

The general economic conditions are summarized as follows: Transportation facilities, fuel, water, drilling and operating costs, market for product.

Railroad facilities are good. The main line of the Great Northern Railroad enters Shelby, and a branch line extends

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from Shelby north to Sweetgrass where a branch line of the Canadian Pacific runs to Lethbridge, 60 miles farther north. The branch line runs along the west side of the Sunburst Field. The towns of Sunburst and Kevin are small centers for local operations. Good roads extend from Shelby to the field, so that motor trucks can be used to advantage for 10 months out of 12. The winters, while cold, are generally open enough for motor transportation.

The short distance to railroad makes oil transportation simple. The Illinois Pipe Line Co. (a common carrier) has a line into the field, a 37,500-bbl. storage tank at Sunburst, and loading racks 1 mile south of Sunburst. This company has planned for a comprehensive network of pipe lines, mains and laterals, which will be built as rapidly as required. At present there are 12 miles of main 4-inch line, and 10 miles of laterals. The price, this year, for transporting oil will be 20c per barrel, but this charge will be lowered when production increases.

Weather conditions are favorable for development. There are occasional snowfalls in winter, but the Chinook winds seldom let snow stay on the ground for more than two weeks at a time. At times the temperatures run to 40 degrees below zero, but not often. Zero is a fair average for three and one-half months, and operating conditions are no more unpleasant than in Pennsylvania, Ohio, or the Mid-Continent, so far as snow and cold are concerned, although the winters are longer. The dry air and clear weather allows drilling operations to continue all winter where water lines are buried.

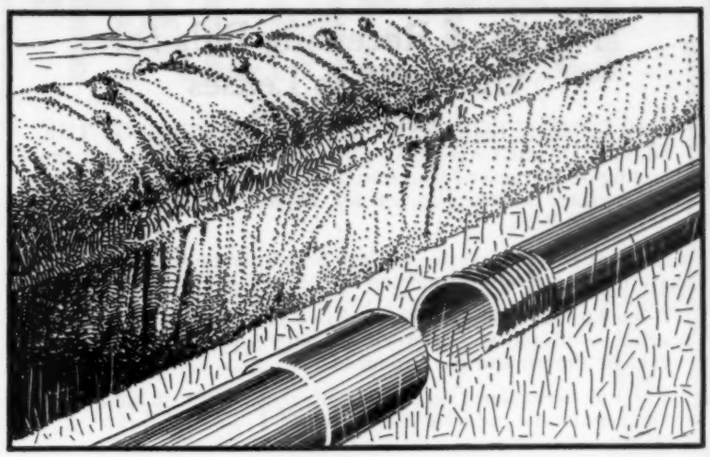
A water scarcity is being faced now. At present, water for drilling operations is obtained from small reservoirs scattered over the field. These reservoirs are built in various coulees and catch the run-off from melted snow and from rains. An adequate supply of water for temporary needs can, however, be secured from reservoirs. Reservoirs capable of furnishing drilling water for 1,000 wells are now being built in the field; these will furnish enough water next year. However, a water line should be laid to one of the streams near the West Butte of the Sweetgrass Hills to afford water for future development on a large scale in the north part of the field. For the southern end of the field, water could be secured from the Marias River.

Fuel for drilling operations is now furnished from gas wells and from oil wells. The Ohio Oil Co. uses gas for its pumping power, and for drilling where the gas is near by. The oil from the wells is an ideal fuel. The present price, November, 1922, at the well is $1 per barrel for fuel purposes. There is plenty of oil and gas to care for a heavy drilling campaign in the field.

Operating Costs and Operations

The cost of drilling and the general operation of wells is higher at present than it will be later, because of the cost of initial wells, and the unsettled conditions always found in new fields. Single wells 1,600 to 1,700 feet deep are completed at a cost of $12,000 to $15,000. Dry holes, the same depth, where casing is salvaged and rigs are used again, cost $8,000. Some holes have been drilled for as low as $5,000. By drilling a number of wells, buying supplies in quantity, and by economical operating methods, the cost of wells can be reduced to $10,000 for a fully equipped pumping well. At present, drilling contracts can be made for $4 per foot, fuel and water being furnished by the operator. Labor contracts can be secured on the basis of $2 per foot.

Some wells in the field have been drilled with portable National No. 28 machines. The most popular and serviceable outfit, because of the ease in handling casing, is a 72-foot derrick with 5-inch standard rig irons and calf wheel. Such derricks are pulled down when the



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IN THE manufacture of casing head gasoline, it is essential that the vacuum on oil and gas wells, receivers, and tanks be kept at a constant. It was in response to this demand that Davis developed the Casing Head Gas Regulator.

When the suction line to each well is provided with a Davis Casing Head Gas Regulator, which may be counterweighted to maintain any desired vacuum, any number of wells may be operated from one station. There may be a common suction main into which lines from the various wells can be connected and different vacuums can be carried on each well.

How this specially designed regulator has been installed at hundreds of wells throughout the Southwest, how its Davis construction assures the reliability and long life that a half century of valve manufacturing brings, how it may be connected to act as a back pressure or relief valve—this is the story of the descriptive folder. Ask the G. M. Davis Regulator Co., 400 Milwaukee Ave., Chicago, for your copy.

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Notice of Receiving Bids for Oil and Gas Leases

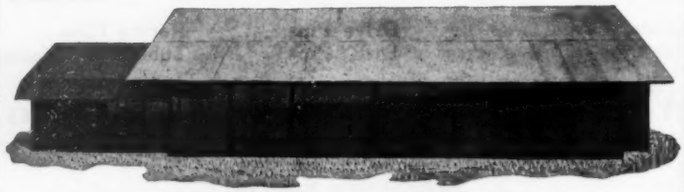
THE COMMISSIONERS OF THE LAND OFFICE OF THE STATE OF OKLAHOMA, will receive sealed bids for the leasing of 46 tracts of land for oil and gas purposes in Garfield, Greer, Kay, Lincoln, Pawnee and Payne Counties, Oklahoma, March 19, 1923.

Some of these tracts are in close proximity to production and are being actively prospected for oil and gas.

Leases to be made for a term of five years and as long thereafter as oil and gas is produced, with a royalty of 12½ per cent of the oil and gas produced.

For full particulars, description of lands, form of bids, rules and regulations, address:

ROBERT L. KNIE, Secretary
COMMISSIONERS OF LAND OFFICE
STATE OF OKLAHOMA.
State Capitol, Oklahoma City, Oklahoma



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The large illustration shows a special model used by the Tropical Oil Company in the Columbian, S. A. oil fields. It carries a corrugated galvanized roof 18 inches above the canvas roof.

Whether for housing purposes or camping or for use on the home lawn, the CLOSE-TO-NATURE Canvas houses have proved their worth in thousands of cases.

CLOSE-TO-NATURE COMPANY
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Notice of Receiving Bids for Oil and Gas Leases

THE COMMISSIONERS OF THE LAND OFFICE OF THE STATE OF OKLAHOMA, will receive sealed bids for the leasing of 25 tracts of land for oil and gas purposes in Kiowa County, Oklahoma, March 12, 1923.

Some of these tracts are in close proximity to production and are being actively prospected for oil and gas.

Leases to be made for a term of five years and as long thereafter as oil and gas is produced, with a royalty of 12½ per cent of the oil and gas produced.

For full particulars, description of lands, form of bids, rules and regulations, address:

ROBERT L. KNIE, Secretary,
COMMISSIONERS OF LAND OFFICE
State of Oklahoma
State Capitol, Oklahoma City, Oklahoma

wells are completed and put on pumping jacks. An ordinary 12 by 12-inch engine is used for drilling.

The average 1,600-foot well requires the following casing:

12½-in., 50 lbs., 200 ft. can be pulled
10-in., 40 lbs., 1,000 ft. can be pulled
8¼-in., 28-32 lbs., 1,400 ft.
6⅝-in., 20-24 lbs., 250 ft. liner, or
5 3/16-in., 17 lbs., 250 ft.

The 12½ and 10-inch casing can be salvaged and a liner of 6⅝ or 5 3/16-inch is used in completed wells. In many cases the holes use 10-inch casing at the start; 2-inch tubing (4½ lb.) is employed for pumping in most wells.

Wells are completed in from 18 to 30 days, where no unusual drilling difficulties are encountered. The Kootenai formation is liable to cave in; and in some instances casing is carried close to the tools. Underreaming is necessary in such instances to save casing. The Ellis and Colorado formations stand up well, however.

Pumping Wells

Some individual wells in the field are now being pumped by walking beam; but wherever a group of wells is completed, the group is pumped from a central pump, the wells being on pumping jacks. One power pump is used for 8 to 12 wells; snow and frost make it difficult to pump a larger number of wells from one plant.

Market for Oil

The market for northern Montana oil is vast. It can be shipped to the Pacific coast and will supply Washington, Oregon, Idaho, Montana, North Dakota, Minnesota, as well as northwest Canada.

The posted market price for oil November, 1922, at Sunburst is 70c per barrel.* The field cannot be developed, with profit, at this price.

The local price should be affected by the building of a refinery at Calgary, now planned by the Imperial, and by local refineries that will undoubtedly be built at Shelby and Great Falls.

*Price January 20 raised to $1 average.

PETROLEUM IMPORTS AT PRINCIPAL PORTS

According to figures collected by the American Petroleum Institute, the imports of petroleum (crude and refined oils) at the principal United States ports for the week ended February 17, totaled 1,945,280 bbls., a daily average of 277,897 bbls., compared with 1,714,262 bbls., a daily average of 244,895 bbls. for the week ended February 10.

Receipts at Atlantic Coast ports were 1,112,749 bbls., a daily average of 158,964 bbls., against 947,995 bbls., a daily average of 135,428 bbls. for the week ended February 10.

Receipts at Gulf Coast ports were 832,531 bbls., a daily average of 118,933 bbls., against 766,267 bbls., a daily average of 109,467 bbls. for the week ended February 10.

Imports of petroleum at principal United States ports are shown in the following table:

Imports of Petroleum at U. S. Ports
(Barrels of 42 gallons)

	Week Ended Feb. 17	Week Ended Feb. 10
At Atlantic Coast Ports:		
Baltimore	140,000	255,000
Boston	136,000	60,000
New York	235,930	297,000
Philadelphia	75,000	123,995
Others	525,819	212,000
Total	1,112,749	947,995
Daily average	158,964	135,428
At Gulf Coast Ports:		
Galveston district	319,000	210,000
New Orleans and Baton Rouge	172,531	291,267
Port Arthur and Sabine district	309,000	265,000
Tampa	32,000	.....
Total	832,531	766,267
Daily average	118,933	109,467
At all U. S. Ports:		
Total	1,945,280	1,714,262
Daily average	277,897	244,895

Note: Figures are presented for the week ended Saturday morning so as to conform with period covered by the Institute report of estimates of daily average gross production. Figures are subject to revision each week. They are complete for all the principal ports where foreign mineral oil is imported.

PANUCO OPERATIONS TOTALED 163 WELLS

NEW YORK, Feb. 24.—During 1922, 163 wells were drilled to completion in 29 of the haciendas in the Panuco heavy oil district, according to the Wall Street Journal. An initial daily production of 243,955 bbls. was estimated from the 93 wells which came in producers; 25 completions were for salt water while 45 were dry holes.

Lomas y Llanos was the scene of greatest activity with 9 producers, 3 salt water, 10 dry holes, Palangana saw 12 producers, 1 salt water and 7 dry holes. These two haciendas, however, are producing little oil at present as salt water has forced the closing in of the majority of wells. Potrero de Ojital had nine successful completions by the Transcontinental and Corona companies, while in Cacalilao, the present site of the major part of the heavy crude production, nine were producers and four each salt water wells and dry holes.

Transcontinental Petroleum Co. (Standard Oil of New Jersey) was the most successful with but two failures out of 11 wells drilled while The Texas Co. got eight producers out of the same number of attempts. Mexican Petroleum Co. maintained the average of successes in the Ebano Field in which it has been operating since 1904 by getting two wells for an estimated production of 5,500 bbls. and seven dry holes for the year's work. The campaign of the Mexican Seaboard was disappointing. Confining its efforts to Cacalilao, 11 wells produced but three successful completions against four salt water wells and the same number of dry holes. Nine wells were drilled by the East Coast (Southern Pacific) and, though seven were successful, their combined capacity was estimated at only 1,765 bbls. daily.

A record of producers, salt water wells and dry holes drilled by each company operating in the Panuco district in 1922 follows:

Company—	Prod.	Salt Water	Dry Holes
Mexican Eagle	..	..	1
Boatner et al	1	..	..
Continental Mexican	2	..	1
Dutch Shell	10	4	..
East Coast	7	3	..
English Oil	1	..	..
Freeport Sulphur	3	1	..
Cia. Financeria	2	..	..
Sinclair	..	1	1
Credito Petroleo	4	..	1
Empire	..	..	1
Head et al	..	1	1
Snowden McSweeney	..	1	..
Mexican Seaboard	3	4	4
Itamex	4	..	1
Jones & Buchanan	1	1	1
Kern Mex	1	..	..
Mariand	3	2	..
La Mexico	1	..	..
United States Mex	2	..	..
Pierce	..	..	1
Mexican Gulf	5	..	3
Mexican Petroleum	2	..	7
Mexico and Oklahoma	..	..	1
Morrison et al	..	1	1
National Oil	2	..	..
New England	4	1	1
New York Maguabes	1	..	..
Norman Mexican	1	1	..
Normexus	1	..	..
Nueva Leon	..	1	..
Paine et al	..	1	1
Pantepec	2	..	..
Panuco Boston	4	1	..
Price & Thomey	3	..	..
R-R Drilling Co.	1	..	..
Taylor et al	..	1	1
Tepetate Oil Co.	1	..	..
Texas	8	..	1
Thomas et al	2	..	..
Tillotson et al	1	..	..
Transcontinental (S.O.N.J.)	9	1	1
Turner & Mead	..	..	1
Vera Cruz Oil Co.	..	..	1
United Dredging Co.	1	..	..
Total	93	26	40

CZECHOSLOVAK OIL AGREEMENT

PRAGUE, Feb. 23.—Time allowed by the Czechoslovak Government for Franco-American Standard Oil Co. to fulfill its oil exploitation rights in Czechoslovakia has expired, but delegates of the company are expected at Prague to discuss a new agreement. The Government, therefore, has postponed negotiations for a new arrangement.

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OKLAHOMA BILL IS OPPOSED BY OIL MEN

That the measure introduced in the Senate of Oklahoma, known as Senate Bill No. 55, providing that commodities produced or distributed cannot be sold to one individual for a different price than to another individual after making allowance for quantity and quality, is injurious to the independent refiner, is the contention of the Western Petroleum Refiners Association, which is said to be making an effort to have the bill defeated. "There are many ways in which this affects the petroleum industry," states one of the members of the association. "If the producer had 2,000 bbls. production per day, he could not sell 1,000 bbls. to the Prairie Oil and Gas Co., and sell the other 1,000 bbls. to an independent refiner at a premium. From one viewpoint that might be all right but from the viewpoint that the independent refiner has to pay a premium if he gets the oil, and that condition might arise in the future, he would be cut off from any possibility of buying the oil at a premium.

"There has been some gasoline bought this winter in this field from refiners by other refiners in order that the refiner making the purchase might be able to store his own gasoline, and the purchases have been made at anywhere from one-fourth to three-fourths cents below the price quoted to the jobber. If this bill becomes a law, one refiner could not sell to another for any lower price than he would sell to a jobber. A wholesale grocer could not sell a case of canned goods for any less price to a merchant for retailing than he could sell to a private individual provided the private individual bought a full case. A manufacturer of oil well supplies could not sell five packers to a regular customer who retailed them one at a time for less money than he could sell five packers to one producer who happened to need that number all at once. There are a thousand ways in which the bill will throttle the industries and commercial life of the State if it passes. Pressure should be brought to bear to defeat it."

PRESIDENT HARDING HONORS MID-CONTINENT OIL OPERATOR

Recent press dispatches to the effect that William N. Davis, of Bartlesville, president of the General Mid-Continent Oil & Gas Association, had been appointed by President Harding as a member of the Federal Tax Simplification Board have been confirmed. The Federal board above mentioned sits at Washington and is composed of three members to represent the Bureau of Internal Revenue and three members to represent the public. Mr. Davis was chosen as one of the three members to represent the public. While they serve without compensation, the members of the board exert a great influence upon the interpretation and administration of the income tax law and are also called upon for suggestions for new legislation.

The news of Mr. Davis' appointment is of great interest to the oil fraternity, as he is peculiarly well qualified to represent the public on matters coming before the board. He has been active in Federal tax matters for several years. Perhaps no man in the Mid-Continent Field is more familiar with the larger phases of income tax problems and their application to the oil industry than Mr. Davis. He has accepted the appointment and will leave for Washington in a few days to take up his duties.

The chairman of the board is W. S. Moorhead, of Pittsburgh, Pa. The personnel of the remainder of the board has not been announced here.

It will be remembered that Mr. Davis served in 1918 as a member of the Tax Advisory Board, then assisting the Commissioner of Internal Revenue in promulgating and applying regulations under the then existing Federal income tax and excess profits tax laws.

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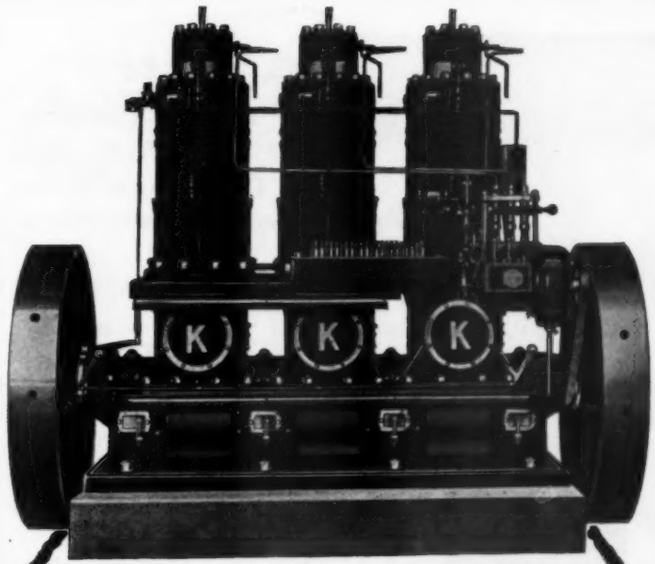

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THE OIL AND GAS PROSPECTS OF IOWA

(Continued from page 86)

bituminous shales occur, somewhere toward the center of the formation, or at least well up from the base. In the Monticello city well, in Jones County, such shales were encountered at 380 to 420 feet. Beneath them and above the Galena dolomite, was 40 feet of light greenish-gray shale. At Animosa, in the same county, somewhat bituminous brown dolomite separated by 30 feet of shale from the Galena, occurs. In the Grinnell city well No. 1, Poweshick County, two feet of bituminous shale and 19 feet of brown calcareous shale was separated from the dolomite by 124 feet of light brown, drab and blue shale. Farther west, at Boone, in the county of that name, black carbonaceous shale was drilled through from 1,395 to 1,405 feet. Beneath this was 25 feet of buff magnesian shale. Bituminous shales were also found in the Mason City well, underlain by 40 feet of blue gray calcareous shale.

If these highly carbonaceous and bituminous shales directly overlaid the porous Galena dolomite over wide areas throughout the State, the stratigraphic relation would be very favorable. However, the intervening shales that occur in all instances are light-colored and frequently calcareous. It is doubtful whether much, if any, of the bituminous matter in the beds above has worked through these lower shales to the Galena dolomite. This probably accounts for the failure of all wells to date to find even showings of oil in this horizon.

The Pennsylvania Formation

Rocks of Pennsylvanian age have been the source of the oil and gas in a majority of the Mid-Continent and eastern oil fields. It is possible they may produce in Iowa. Such rocks underlie the drift from Marshall County, in central Iowa, to the southwestern corner of the State. The formation is divided into two stages. The upper is the Missouri, the lower the Des Moines. The former outcrops in the southwest part of the State, the latter in the central and southern part.

The sediments of the Missouri stage are chiefly calcareous shales and heavy beds of limestone. Logs of wells, except that of the city well at Glenwood, in Mills County, adjacent to the Nebraska line, show very little sand in this group. No exposures of sandstone appear along its outcrops in Adams, Montgomery, Page or Taylor Counties. Keyes[1] gives the total thickness of this series as 1,400 feet. This was measured across the outcrop. Core drillings near the southeastern part of the State show 950 feet. The limestones of this group are hard and coarse-grained, and the paucity of sands makes this formation unfavorable for oil and gas, except in the western part of the area, near the Nebraska line. The city well at Glenwood, above mentioned, shows several sands in the basal portion of the Missourian, and numerous beds of blue, dark blue and black shale. Records of wells Nos. 1 and 2, at the School for the Deaf at Council Bluffs, Pottawattamie County, similarly shows sands in the lower part of the Missourian. Here the section is favorable. In the rest of the southwestern area underlain by Missourian sediments, one must look to the underlying rocks of the Des Moines stage for oil or gas.

The Des Moines group consists largely of shales with thin persistent limestones, coal seams, and sandstones. The latter are usually present near the base. The shales, for the most part, are gray or blue in color, though thick beds of dark drab and black shales are not uncommon. Red shale occurs in many places. Lithologic characteristics change rapidly along the strike of these rocks. Pure clay shales give place horizontally to limestone, sandstone, or coal, and coals and fire clays near the bottom of the formation thicken and thin rapidly. Coals

[1]Proc. Iowa Acad. Sci., Vol. 7, 1899, p. 82.

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in the middle of the group are thinner but more continuous and dependable. Keyes[6], in speaking of these lower coal measure shales, says: "The dark colored shales vary greatly in composition, but they all contain more or less carbonaceous matter—and in many of these shales oily matter is widely disseminated." Lees[7] gives the total thickness of this group as 750 feet and states that borings usually show 500 to 600 feet. Even this thickness probably occurs only near the axis of the geosynclinal basin in Page, Taylor, Union and adjacent counties. In the log of the Glenwood city well, the Des Moines group is 390 feet thick. It is reported from a depth of 845 to 1,235 feet. The upper part is shale and the lower consists of beds of sandstone, shale and limestone, varying from 3 to 36 feet in thickness. Sandstone is predominant. In the log of the deep well at Atlantic, Cass County, the thickness of the Des Moines and Missouri combined is only 620 feet. The lower part, or the Des Moines, consists of sandstone, blue, black and yellow shales interbedded in layers from 5 to 40 feet thick, with sandstone again predominating at the base. In the deep well at Bedford, in Taylor County, near the Missouri State border, the Des Moines is 580 feet thick. From 960 to 1,160 feet, variegated shales were drilled through. From 1,160 to 1,340 feet, sandstone. In the record of the Greenwood Park well at Des Moines, this group consists of black, gray and blue shale from 14 to 498 feet. It is to be noted that this log shows no sands in the Des Moines, while all the deep wells to the southwest showed sands especially near the base of the formation. At Clarinda, in Page County, the Des Moines began at 715 feet, according to Leonard, and consisted of coal, soapstone, white, gray, blue and black shale to 1,002 feet, the bottom of the hole. It is unfortunate that this well did not go deep enough to encounter the heavy basal sandstone found in the Bedford well, 18 miles to the southeast. It is located on the extreme western flank of the Hawleyville anticline mentioned below. Few deep wells, besides those mentioned above, have been drilled in this region, for here, as in other parts of Iowa, most of the towns get their water supply from the surface drift and the immediately underlying rocks.

The Des Moines formation is a possible and even probable source of oil or gas in Iowa. In prospecting for these substances, it would be best to drill in the area in which the Des Moines sediments are well covered by rocks of the Missouri group. Here natural outcrops are scarce and confined to the vicinity of streams. In spite of this fact, this territory would be well worth scouting for anticlines or domes. Good structure would be necessary, since the sandstones of the Des Moines group are water-bearing. Should such structure be found, the prospector would still have to risk the lenticular and changing nature of the upper Des Moines sandstones and shales, as evidenced along their outcrop. He should encounter the basal sandstones over most of this section of the State. Included in this area are Ringgold, Union, Adair, Cass, Adams, Taylor, Page, Montgomery, Pottawattamie, Mills, Fremont and the western parts of Decatur, Clark and Madison Counties. In some localities coal mines will help in the determination of structure.

Local Structure

This paper is written from a stratagraphic, rather than from a structural viewpoint, but some structural features may well be pointed out.

Structures With Ordovician Rocks as Objectives

A large ge-anticline extends into southeastern Iowa, but its oil possibilities have been tested with negative results to date, by water wells which pierce the Ordovician strata. Another structure underlain by Ordovician rocks is an extensive fold which begins in Delaware County

(Continued on page 114)

[6]Iowa Geol. Surv., Vol II, p. 126.
[7]Ibid, Vol. XIX, 1908, p. 601.

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DEVELOPMENT OF GULF COAST FIELD

(Continued from page 102)

trusion of the salt through the original formation. This black shale is not a definite horizon, as paleontologic studies seem to indicate that it may be of different ages in different domes. At Humble and Hockley, the black shale is classed as of Jackson age, while in some of the other domes it is either Oligocene or Miocene.

The heaving shale is somewhat closely related in nature to the black shale. It gets its name from the fact that when penetrated by the drill, it heaves out of the well, often bringing the tools with it, and it has not been found practicable to penetrate this formation with rotary tools. It differs from the black shale in the fact that it is not commonly soaked with light oil, and is very dry in nature. On the other hand, its position with respect to the salt is closely analogous to the black shale; it lies in nearly every instance directly on the salt.

The heaving nature of this material is to be accounted for either by its dry nature or its steep dip, the latter being produced unquestionably by the intrusion of the salt through the original formations. The heaving shale may be of different ages, ranging from Jackson to Miocene, and its character is to be ascribed probably to the squeezing effect of the intruding salt.

Drilling Methods

The main improvement to be noted in regard to the drilling of wells in the Gulf Coast is the increased use of the coring process. Practically all the large companies, and many of the wildcatters, are now taking cores of the formations penetrated at varous intervals and mainly, when the productive sands are reached. The increased number of cores is contributing decidedly to the knowledge of the character and age of the formations penetrated, and is reducing the risk attendant on the bringing in of wells, because it is possible to know more definitely the exact point at which the oil sands occur.

Cores are only taken at intervals, and generally cores no longer than two feet are recovered. It is being urged by the geologists operating in this section that complete cores through the oil-bearing sands should be taken so that it will be possible to segregate the oil sands from the water sands in finishing the well, thereby greatly increasing the number of successful completions in the oil-producing areas.

Major Operating Interests

The operations in the Gulf Coast fields are mainly controlled by three strong companies: The Gulf Production Co., subsidiary of the Gulf Oil Corporation, The Texas Co., and the Humble Oil & Refining Co. A number of smaller companies, such as the Republic Production Co., Houston Oil Co., Sun Oil Co. and the Sinclair Oil & Gas Co., have considerable production, but they are not as active as the three major interests. Besides these there are a number of companies and a few individual operators, but their proportion of the production is relatively small.

The main pipe lines are owned by the three major operating companies, namely the Gulf Pipe Line Co., subsidiary of the Gulf Oil Corporation, The Texas Co., and the Humble Oil & Refining Co. In addition, the Sun Oil Co., and Sinclair Co., have lines to a number of the fields.

Prices paid for crude oil in the district are determined by the three major interests and advances or cuts in field quotations posted by one of the three major companies are promptly met by the other four purchasers of oil.

NATIONAL TRANSIT DIVIDEND

OIL CITY, Pa., Feb. 24.—The National Transit Co. has declared an extra dividend of 50 cents, payable March 15 to stockholders of record February 28.

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MID-CONTINENT PRODUCTION ON UP GRADE

(Continued from Page 9)

Cacalino Sector of the Panuco Field is a 5,000-barrel well at 1,600 feet. La Corona Petroleum Co.'s No. 10 on the same lot, is a 1,000-bbl. well at 2,339 feet. In the Ebano Pool is a 1,000-bbl. well, the Mexican Petroleum Co.'s No. 23 La Dicha at 1,855 feet. There were no completions in the south fields.

California

California production is estimated at 594,000 barrels. Of this, Los Angeles alone, is producing over 275,000 bbls. The Petroleum Midway Co.'s No. 1 Foix, at Santa Fe Springs, is a 5,000-bbl. well. The Superior Oil Co.'s No. 1 Baldwin is good for 8,000 bbls. Standard Oil Co.'s No. 1-A Koontz is making 6,500 bbls.; Elliott Petroleum Syndicate's No. 1 Clarke, 6,000 bbls, and No. 4 Julian 4,000 bbls. Three wells of 3,000 bbls. each were completed in the Huntington Beach Field by the Amalgamated Oil Co., No. 3 Fowler, No. 2 Dennison and No. 30 Miley-Keck, while Selby, Root & Hogue have a 3,000-bbl. well in No. 2 Clark. At Long Beach, the Shell Co.'s No. 1 Alamatos is a 4,000-bbl. well and No. 8 Transport a 3-000-bbl. producer. Davis & McMillan's No. 2 started at 3,000 bbls. Late estimates on production place Long Beach at 139,500 bbls., Huntington Beach, 123,000 bbls., and Santa Fe Springs 115,000 bbls. daily.

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Ardmore, Okla., Feb. 23.—Walter McGee, aged 33 years, night stillman of the Imperial Refining Co., near here, was burned to death and a pecuniary damage of between $5,000 and $10,000 sustained by the refinery in a fire which occurred Wednesday night. The cause of the blaze was the breaking of a crude oil pipe line connected to a still.

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Notice is hereby given that on March 5, 1923, at ten o'clock A. M. at the Office of Commissioner of Public Lands, in the State Capitol Building, at Cheyenne, Wyoming, the State Board of Land Commissioners will receive and consider sealed proposals for a five (5) year operating oil and gas lease on the following described land:

All Section Thirty-Six (36), Township Forty (40) North, Range Seventy-nine (79) West, of the Sixth Principal Meridian, containing 640 acres more or less, in Natrona County, Wyoming.

Each proposal must be accompanied by a certified check for Twenty-five Thousand Dollars ($25,000.00) payable to the Commissioner of Public Lands for the State, as a guarantee that should the proposal be accepted by the Board, the terms of same will be fulfilled by the proponent. No proposal will be considered which is for less than the present posted market price. The Board reserves the right under the law to reject any and all proposals.

In deciding to offer the lease on the above described land for sale, the Board is influenced by a desire to aid in the upbuilding of the oil industry of the State, and in considering bids that bid will be accepted which, in the opinion of the Board, is in line with this policy. Therefore, the amount offered for the lease in any proposal will not be the sole consideration in arriving at a decision.

The present lease on the above described land expires Sept. 30, 1924. The new lease to commence Oct. 1, 1924, running for the term of five (5) years.

(SEAL) WILLIAM B. ROSS,
Governor, President State Board of Land Commissioners.
C. H. McWHINNIE,
Commissioner of Public Lands, Secretary.
Date—February 17, 1923.

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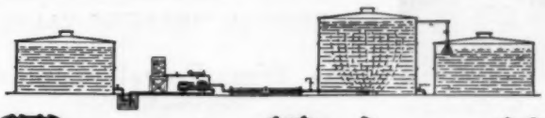

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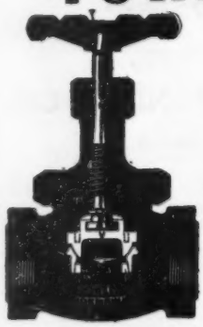

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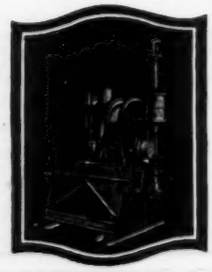

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(Continued from page 111)

and extends northwestward across Buchanan into Bremer County. A possible structural "high" is indicated near the town of Tripoli, Bremer County, by an exposure of Niagaran dolomite in an area elsewhere covered by Devonian rocks. From the Little Wapsipicon River, 1½ miles south to the town of Fairbank, Bremer County, the strata have an exaggerated southerly dip caused by this folding.[8] The log of the deep well at Waverly, located probably to the west of the axis of this structure, showed calcareous blue to greenish shales from 140 to 260 feet, the top of the Galena dolomite, and calcareous green shales from 620 to 630 feet, the top of the Platteville limestone. Wells drilled on this uplift would reach the Ordovician rocks at shallow depths, but the prospects are not encouraging.

Another structure of considerable magnitude, discovered by Bayer, elevates the St. Louis limestone along South Skunk River about Ames.[9]. The deep well at the Iowa State College of Agriculture & Mechanical Arts encountered Mississippian rocks at 120 feet, and the Galena at 1,040 feet. The log of the well appears to have been carefully kept; in it, the Galena is reported as limestone, instead of the more porous dolomite. Above the Galena occurred 50 feet of calcareous blue shale. The Platteville is not dolomitized, and the green shales above it are nearly wanting. Though this well was apparently located on the uplift, it obtained no shows of oil whatever.

About 15 miles southeast of Des Moines and 1 mile east of the town of Ford, in Warren County, the crest of a low anticline passes through Section 10, Township 77 West, Range 22 West, and extends in a northwest-southeast direction through Sections 12, 13 and 24 of Richland Township.[10] Here the top of the Galena would be reached at depths of from 1,200 to 1,400 feet. Structurally this area is probably favorable. From a stratigraphic viewpoint, previously discussed, the writer would not recommend a test to the Ordovician strata anywhere in Iowa, except on a structure, if such could be found, in the area around Fort Dodge, where bituminous shales directly overlie the porous St. Peters sandstone.

Structures With Pennsylvanian Rocks as Objectives

An anticline crosses the State line at the town of Bradyville, in Page County. At this point it has a reversal of 25 feet to the southeast. The direction of this structure is east of north and for considerable distance it follows the course of the East Nodaway River. It is known as the Hawleyville anticline; the latter town being 15 miles north and a little east of Bradyville. At Clarinda, which lies on the west flank of this structure, the dip to the west is 65 feet in 2 miles. The axis of this structure passes east of the old Shambaugh mill and all the coal mines in the vicinity of Shambaugh. In its northern extension, it passes to the east of the town of Henshaw in Taylor County; here there is a dip of 35 feet to the west in a quarter of a mile. If, as reported, this fold extends from Bradyville to Henshaw, it is an anticline of considerable extent. Detailed work on the coals and the few outcropping beds in this area would be necessary to determine any local domes along the axis. The region is largely covered with drift, and such work would be difficult, though the local coal mines would be of service in this connection. It is the opinion of the writer that this structure should be tested to the bottom of the Des Moines formation. Judging by the Clarinda well previously mentioned, such test would have to go to a depth of 1,200 to 1,300 feet.

At Villisca, 12 miles north and a little west of Hawleyville, an uplift of the strata has caused the coal to be eroded at that place.[11]

[8] Iowa State Geol. Surv., Vol. VIII, p. 220; Vol. XII, p. 27.
[9] Water Supply Paper 293, U. S. G. S., 1912; pp. 670 and 744.
[10] Iowa Geol. Surv., 1895, Vol. 5, p. 354; Vol. III, pp. 139-140.

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Near Essex, in the northwestern corner of Page County, a bed of limestone in Section 36 of Pierce Township dips rapidly westward, and may indicate another fold in that vicinity parellel to the Hawleyville anticline.[12]

Conclusion

Beginning with the lowest horizon which might possibly contain oil, the St. Peter sandstone, the area around Fort Dodge seems to be worth examining for good structure, since the log of the deep well at that place shows the St. Peter sandstone to be overlain by bituminous shales. Eastern and central eastern Iowa are not encouraging districts to prospect for oil in the Platteville, nor Galena horizons. In western Iowa, they would be too deep. The Platteville, though in places overlain by carbonaceous black shales, is usually a hard granular limestone; the Galena is generally separated from the carbonaceous shales in the overlying Maquoketa by 20 to 30 feet of light calcareous shales.

In southwestern Iowa, in the counties before outlined, the Des Moines formation may produce oil and gas; and the basal section of the Missouri formation is favorable in the extreme southwestern counties of Ottawa, Mills and Fremont. This section of Iowa should be prospected. It is strictly wildcat territory, however, and should production be found, it may not be large, judging by the closest production to the southwest, in Missouri and Kansas.

The fact that no oil or gas in commercial quantities has been developed in Iowa to date is not encouraging; nor is it a favorable sign that the production in the Mid-Continent fields becomes small and plays out to the northeast. At present there are still favorable areas in Kansas, Oklahoma and Texas in which to look for oil. In years to come, however, these will have been developed, and the wildcatter will have to look beyond his present horizon. Then, in the writer's opinion, it will be time to prospect in Iowa.

[11]Iowa Geol. Survey, Vol. XIX, 1908, p. 626.
[12]Ibid., Vol. XI, 1900, p. 449.

OIL EXPORTS INCREASE; VALUE IS MUCH LOWER

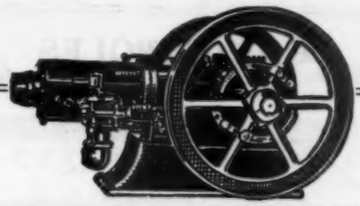
NEW YORK, Feb. 24.—Crude and refined oil exports in December, 273,833,759 gallons, were 26,026,283 gallons over November and almost 45,000,000 gallons above December, 1921. They were the largest exports since January, 1921, according to the Wall Street Journal.

Gas and fuel oil were chiefly responsible for the gain, 79,550,250 gallons exported being largest since September, 1921, when 85,840,900 gallons were exported. Compared with December, 1921, an increase is shown for every petroleum product except lubricants, but values are either relatively or actually less. A gain of almost 11,000,000 gallons occurred in gasoline exports, value of which was $600,000 higher.

For the full year, oil exports totaled 2,921,249,104 gallons, valued at $330,727,393, compared with 2,788,776,639 gallons, valued at $383,680,003, in 1921. Thus, while quantity gained 132,472,465 gallons, with gas and fuel oil the only petroleum product showing a reduction, lower prices resulted in total value of $52,952,610 less than in 1921.

The following table shows the quantity and value of oil exports in December, 1922, and for the entire year:

December	Gallons	Value
Crude pet.	46,554,158	$ 1,663,271
Gas and naphtha	47,222,658	9,438,586
Kerosene	78,133,354	7,156,944
Gas and fuel	79,550,250	2,240,552
Lubricants	22,372,375	5,634,054
Total	273,833,795	$ 26,073,407
Twelve Months		
Crude pet.	419,793,896	$ 18,248,110
Gas and naphtha	579,062,606	126,826,842
Kerosene	895,230,641	83,134,510
Gas and fuel	697,219,404	25,959,704
Lubricants	329,943,157	76,458,227
Total	2,921,249,104	$330,727,393



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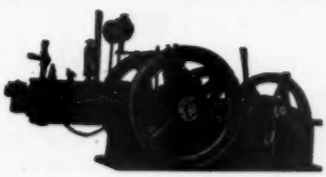

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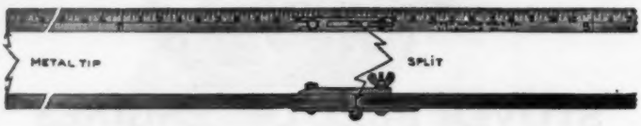

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(Continued from page 14)

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An example of the kind of men these students are, is an Englishman, who, before the war, was wealthy and engaged in a profitable business in the Balkans. He enlisted and served through the war. After the war, he found his business practically destroyed by conditions existing in the Balkans while low exchange rates and other conditions had reduced his finances to a dangerously low point. He came to this country and applied to the Standard Oil Co. of New Jersey for a position with that concern abroad, he having had some experience in the oil fields of Rumania and other foreign countries. He was sent to the Carter camp where he is now employed as a roustabout, and residing in one of the bunk houses. However, he is more than delighted with his work and living conditions at the camp.

"This is the life," he said to the writer. "I wouldn't change it for anything."

One of the most striking features of the Carter camp is the cleanliness and the orderliness evident everywhere, even around drilling or pumping wells. Every tool and piece of equipment has its certain place and is kept there. There are no loose boards or small pieces of wood laying around the property. Not even a piece of paper was seen on the ground anywhere in the camp or in the field during a three-day visit to all parts of the field. This desire to keep the camp and field clean, which prompts the company to go the limit to achieve it, has been taken hold of by all employes and residents. The drillers, tool dressers and pumpers rake all the ground around the derricks until every loose stone is picked up, and every chip of wood and all other things which might mar the appearance of the place removed. The result is the ground around every derrick is smooth and clean without any of the oily muck and grease so evident in most oil fields. Every well, after it becomes a pumper, is refitted, belt houses and engine houses are covered with corrugated iron to protect them from the elements.

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PROTECTING PENNSYLVANIA GRADE OF CRUDE PETROLEUM

BRADFORD, Pa., Feb. 24.—The Era says: A remedy, ready made, appears to be at the disposal of Pennsylvania oil producers, who, with good cause, have complained of unfair competition due to the blending of inferior oils with Pennsylvania grade and marketing of the blended products a pure Pennsylvania product. Application of this remedy as outlined below clearly is a matter for the various associations of the industry in local fields.

At different times in the recent past the assertion has been presented to local oil producers that if proper Federal legislation could be procured requiring the branding of refined products made from Pennsylvania crude, or to prevent inferior oils from being sold as Pennsylvania oil, it would result in a much greater demand and a higher market would be obtained by local producers, it being asserted that for every barrel of Pennsylvania crude produced probably 100 bbls. were being marketed under the name of Pennsylvania products.

Starts Investigation

A. R. Johnson, local producer and refiner, felt that there was a great deal of merit in the contention, but realizing the almost hopeless task of securing National legislation, for the reason that the oil producing States whose inferior products compete with the Pennsylvania crude would solidly oppose it, began an examination of what might be accomplished under present statutes, utilizing such agencies as already exist.

Enlisting the co-operation of Attorney H. M. Wick, he submitted a hpyothetical case to the Federal Trade Commission and was agreeably surprised to learn that an almost identical case had just been started by that body. The outcome of this was that the Penn Lubric Oil Co. of Kansas City, Mo., against which complaint had been filed, was ordered to cease and desist from using in letters, circulars, posters and other advertising matter in connection with the sale of its oil products which are compounds or mixtures of Pennsylvania oil with oil produced in any other State than the State of Pennsylvania, whether sold under the name of Ploco, or any other name, the word "Pennsylvania" or words "Pennsylvania oils," without conspicuously disclosing in such advertisements that such blended oils are made by combining the Pennsylvania oil with Mid-Continent or other oils, so as to clearly indicate that such oil or oils is not made wholly from oil or oils produced in the State of Pennsylvania.

STATE GEOLOGIST RESIGNS

CASPER, Wyo., Feb. 24.—Glenn B. Morgan, State geologist of Wyoming, has resigned and will enter the field as a geologist for the petroleum and allied industries. Mr. Morgan has been State geologist for the past six years and had still two years to serve of his present term. He has rendered the State and especially the oil business, a great amount of help in the field work and always was especially helpful when technical questions relating to the operation of the fields came up before the Legislature. Much interest is being shown in the appointment of a successor to Mr. Morgan and the name of Albert Bartlett is mentioned as a possible appointee. Mr. Bartlett is a graduate of the Missouri School of Mines and has been in Wyoming as a civil engineer for many years.

OIL PRODUCTION IN INDIA

WASHINGTON, D. C., Feb. 24.—Vice Consul Harold Schantz at Calcutta informs the Department of Commerce that statistics just available through the Geological Survey of India give the total production of petroleum for 1921 as 8,773,806 bbls. (of 42 gallons each), a gain of 342,857 bbls. over 1920. The value of the 1921 production is given as $21,014,906 (converted at $3.75 to the pound sterling).

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65—Cameron steam pumps, ranging in size from No. 12 to No. 3 pumps.
10—Knowles pumps, ranging in size from No. 6 to No. 8.
8—Worthington pumps, ranging in size from 4½x2¾x4 to 7½x4½x10.
10—Marsh vacuum pumps, ranging in size from 6x4x10 to 5x6x10.
20—Open Webster feed water heaters, ranging in size from 250 h.p. to 1200 h.p.

HOISTING ENGINES

45—Duplex hoisting engines with both single and double drums, ranging in size from 18x42 engine with a single drum 6' diam.x52" face, grooved for 1⅛" rope to a 4x5 vertical duplex hoist with one drum 12" diam.x27" face. These hoists are made by various builders, including Allis-Chalmers Mfg. Co., Webster, Camp & Lane, Lidgerwood, National Iron Works, Duluth, Bullock, Sullivan and Lake Shore Engine Works.

PUMPS

6—No. 9 Westinghouse air pumps.
9—9½" Westinghouse air pumps.
11—11" Westinghouse air pumps.

STEAM ENGINES

12—Simple steam engines, ranging in size from 16x36 Reynolds Corliss engine to a 4x5 simple slide valve engine.

GASOLINE ENGINES

4—4-ton Whitcomb gasoline locomotive, 24" gauge.

DIAMOND AND OTHER DRILLS

6—Sullivan diamond drills, styles "C," "H," "B," and "S."
3—Bullock diamond drills.
5—Model 60 Denver drifting drills, 1⅛" steel.
3—Model 50 Denver Clipper drills, ⅞" steel.

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FOR SALE

WYOMING oil leases for 10 cents an acre. Write Dept. B, 319 Symes Bldg., Denver, Colo.

FOR SALE—I own 120 acres close up to LeGrand & Berry's new location in Ouachita County, Arkansas. Will sell lease on 10, 20, 40 or all at $50 per acre. Title good. I guarantee acreage not to be over ½ mile from well. I need money and cannot afford to take gamble. Acreage will be worth from $1,000 to $5,000 per acre within 60 days if they get well. They know their stuff and they get the oil. Wire or write Tom Thompson, Camden, Ark.

FOR SALE—26 Star drilling machine, three stems, up to 10-inch tools; mounted boiler, Moon generator, complete equipment, excellent condition. Cheap. Box 393, Bowling Green, Ky.

FOR SALE—At Larkin Packer Co., Bartlesville, Okla.—
4—26"x12' Bridgeford Lathe, with taper attachment.
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1—18"x 8' American Heavy Duty Lathe, with Turret.
1—26" American Shaper.
1—1100-lb Bement-Niles Steam Hammer.
1—2000-lb Bement-Niles Steam Hammer.
1—70-Horsepower Stationary Boiler.

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FOR SALE—Production in Allen and Warren Counties, Kentucky: 5 to 100 bbls. Price right. Fifty acres free for well. Further particulars, address Box 856, Bowling Green, Ky.

FOR SALE—2,000 feet of 10-inch 10-thread casing. Bought new, used one hole. Guaranteed real casing; $1.35 f.o.b. cars. O. C. Wemhaner, Hebbronville, Texas.

FOR SALE—Complete string of standard tools. Bought new and drilled only one 3,500-foot hole. All for $4,000 cash; also irons. O. C. Wemhaner, Hebbronville, Texas.

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FOR SALE—15-acre lease, two wells, standard equipped, two locations, 250 bbls. settled production, 2,000-bbl. steel storage, Calion Field, Arkansas. Fine for new oil company. Write S. B. C., care The Oil and Gas Journal.

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and professional men should be interested to know that it costs but $5 a MONTH to insert a professional card in The Oil and Gas Journal.

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